RAILROAD GAZETTE

SATURDAY, APRIL 3, 1875.

Contributions.

Cars with Depressed Bodies.

KEOKUK, IOWA, January 27, 1875.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I am impressed with an idea that some effort should be made if possible to reduce the number of accidents that so frequently occur on railroads, both at home and abroad.

It is no uncommon occurrence to hear that the passenger coaches have jumped the track and rolled down an embankment, killing and wounding many of the passengers; also destroying valuable property.

To try and lessen these accidents, I propose to lower the center of gravity of the cars by allowing their bottoms to come down within four inches of the rail, so that if a wheel should break or get off the track, the whole body of the car would rest upon the rails and form a self-acting, instantaneous *brake*. To make myself understood by your readers, I have prepared the sketch herewith of my plan, which is freely given to the public. Fig. 1 is a side elevation of a passenger car; Fig. 2 an end view of the same, as proposed by me; Fig. 3 an end view of the car as at present constructed.

Figs. 2 and 3 are shown on an embankment. The eye will at once see the difference between Figs. 2 and 3. If a wheel breaks on Fig. 2, there is some chance that the car would rest upon the *rails;* but if a wheel break on Fig. 3, it would be almost a miracle if the car did not roll down the bank.

This plan of keeping the center of gravity in carriages low I first observed in the sedan chair, next in the London cabs, then in the cotton drays of Liverpool, and now in New Orleans, La., wagons or floats whose bottoms come within a few inches of the street are common. Thus commercial men change their old customs to save money or labor. Might not the railroad community lower their cars so that they will give some chance for passengers to escape death by accidents that might happen by the jumping of a car or the breaking of a wheel?

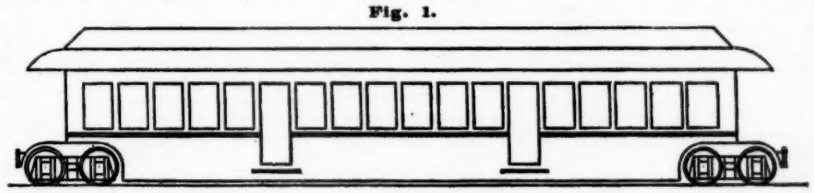
JOHN ROY.

[Mr. Roy is somewhat late in his invention, inasmuch as it has been in use on the New York Elevated Railroad, and was illustrated in the *Railroad Gazette* several years ago. The same plan was also in use on the Baltimore & Ohio Railroad forty years ago. The objection to it is, first, that it is impossible to extend the central floor timbers through the whole length of the car. It is therefore impossible to make the frame as strong to resist concussions as an ordinary car body. Another objection is that in case the trucks should meet with an obstruction, such as running into a culvert, they would crush through the depressed part of the car and thus do much more injury to passengers than would be caused if there were no such depression.

The car referred to, which was used on the Baltimore & Ohio Railroad, was built by Ross Winans in 1833 or 1834, and was, we think, called the "Dromedary." It is described and illustrated in the printed volume of testimony taken in a suit in equity of Ross Winans *vs.* The Eastern Railroad Company in the Circuit Court of the United States, Massachusetts District, October term, 1853.

As this plan is reinvented every few years, we are thus explicit in citing authorities, so as to relieve the minds of inventors.—EDITOR RAILROAD GAZETTE.]

Fig. 1.



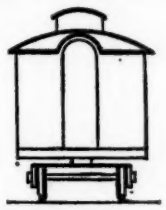


Fig. 2.

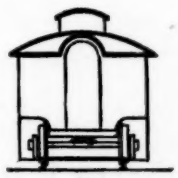


Fig. 3.

"NEW" (?) SAFETY CAR.

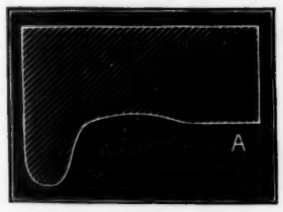
Some Subjects That Deserve Investigation.*

TO THE EDITOR OF THE RAILROAD GAZETTE:

One question for discussion and investigation that I would propose is in regard to the proportions of the top of the rail—that part in contact with the wheels. Are the proportions, as in general use, so far as width of top is concerned, the best and most economical in the end? If it has been demonstrated that a 2¼ inch width of top is better than 2 inch, and that 2⅛ inches is better than 2¼ inches, then is 2⅛ better than 2¾ inches? By using the latter size, would it not be more economical, *all things* considered? Rails would be heavier slightly, but the bearing surface, or point of contact, would be increased in the only way it can be, without increasing the diameter of the wheels, on the principle of lengthening a journal to increase the wearing surface. If increased surface of rail will add to its durability, will not the effect upon the wheels be equally beneficial? It would be but seldom that the plane represented by the top of the rail, and that of the face of the wheel, would coincide nearly enough to give a contact the entire width of the rail at any one point, yet it would have the effect of shifting the bearing to all points on the surface of the wheel, and thus add greatly to its durability. Why should wheels and rail be of such proportions in width as that the wheels present this appearance when worn out, or when turning off becomes a necessity; or why should the top of the rail be so narrow as to permit only about one-half the width of the face of wheel to come in contact with it? The part at *A* being scarcely worn at all in the ordinary wear of a wheel, would, if allowed to do its share of "carrying," by taking its turn at rolling on the rail, add at least one-third to the wearing value of it. Another advantage in giving a bearing to the whole surface of the wheel would be to preserve the original shape of it as it wears; so that when worn out, no such elevation will be found on the outer edge as that shown at *A*, and when no such *prominences* are found on wheels less damage will be done to the rail and frogs, crossings, etc., and the motion of the cars will be easier, and the of rolling friction less than occurs where wheels are worn until a shape shown by the sketch. It seems to me these matters are worthy of some investigation, that we may know whether we have as yet got the right proportions in practice. A wider top rail than in present use may be of disadvantage in case of snow or sleet, but to what extent experiment only can determine.

Another matter: It is very generally believed that the wear of tire on driving wheels is in proportion to the weight, and is also somewhat affected by the speed—the higher the speed the greater the wear, other things being equal. Yet on investigation it will be found that the proportions of weight on the wheel, and the power applied to it, and the load drawn figure in the matter more than the weight alone. For instance, with a driving-wheel bearing on the rail with a weight of 9,000 lbs. of an engine working up to her full capacity, the wear of the tire will be greater than if the weight is 12,000 lbs., *the load drawn and other circumstances being the same in each case*, for the reason that the weight in the former case is not enough to give adhesion sufficient to overcome the tendency of the wheel to gain on the number of revolutions due to a certain length of track—a sort of *imperceptible slip* going on continually as long as the propelling power is applied, and it is this "imperceptible" slip that causes the rapid wear of the wheel. Now if this rapid wear takes place in the case of the lighter wheel, is not the wear of rails in the same proportion as that of the tire? If so, then, so far as the *wear* of the rail due to the propelling power of the driving-wheels is concerned, it is less in the case of the *heavier* driving-wheel.

Investigation on these points is necessary in order to determine what is the *economical weight* for drivers drawing trains of a given weight, and as to what the actual advantages of a ten-wheel engine (6 drivers) are over an eight (4 drivers) wheel for freight service, and whether the weight carried on six drivers would be more economical than if carried on four, and to what point drivers may be *loaded* without greater injury to the rails than would occur by a greater *number* of



drivers but of less weight, in doing a given amount of work. The question arises, have we arrived at perfection in the proportions of wearing surface of rails and wheels, and if not, in what particular can improvement be made? Have we not given "heavy drivers" credit for doing greater damage to the rails in *crushing* and wearing them than actually occurred?

By increasing the bearing surface of the wheels that *carry* only, we might inquire whether it would be economy to increase the load in proportion. What is the *economical* load on a wheel, all things considered, to do a given amount of work? Would it be more economical to carry 60,000 lbs., on 12 wheels than to carry it on 10, including original cost of wheels, maintenance, etc.?

Again: What is an *economical* speed for freight trains? Aside from the resistance of the atmosphere, does rolling friction increase with the speed, and can any great reliance be placed upon "text books" or popular belief on this subject? To what extent is a high speed economical in going down grades in order that the momentum may be made use of in ascending the next one, on the principle of a fly wheel (a reservoir of power to draw from; an equalizer of force)?

"Time" being "money," the more rapid the transit the less rolling stock is required to do the business, and the greater would be the economy (considering the wear and tear to be the same at all speeds).

These are questions of no small importance, and should be investigated in a long-continued series of experiments with a registering dynamometer between the locomotive and train, under all the varying conditions of grade, curvature of track, speed and weather incident to transportation on ordinary roads in this country, in order to get an *average* under all probable conditions, that we may have something tangible, or at least better or more reliable than the present semi-guesswork as to what changes from our present practices will be *improvement* and *economy*.

Another subject for investigation is: What changes from the ordinary form of fire-box of coal-burning engines, and what change in the proportions of fire-box (fire) surface and tube surface to the cylinder capacity, from that now prevailing would be more economical in the consumption of fuel? Would a long, shallow fire-box be better than a deeper and shorter one, of *the same fire surface*, for bituminous coal; and would an increase in fire-box area over that in practice be economical? If so, where is the limit, and is a *slow* combustion on a *large grate area* more economical than a more *rapid* combustion on a *smaller grate*, the fire-box area *above* the grate being the same in both cases? As fuel is one of the most expensive items in the cost of transportation, the above subject is worthy of careful investigation in order to reduce the consumption of fuel to a minimum; and it is my impression that that point has not yet been attained in the best practice. A larger fire-box area and surface and perhaps slightly *less* water spaces, with the present grate area, and admission of air at the top of the fire, at points farthest from the tubes, and where the draft will cause it to pass as close over the top of the burning coals as possible (in order to mix with the hydrogen as it is evolved from the coal by the heat, and unite in combustion, before passing to a point where the temperature is too low to admit of combustion, which is the case in the tubes,) and in quantities to suit the proportion of hydrogen *in the kind of coals burned* (the less hydrogen the less air required to be admitted *above* the fire) are, in my opinion, the direction of economy in this particular. (Water spaces too large are as objectionable as if too small, so far as consumption of fuel is concerned.) Moderate water space (say 3 in.) for fire-box and ¾ in. between tubes at fire-box end, but *more* heating surface, it seems to me, would be economy, over present proportions. Extending the heating surface results in less evaporation required from a given *surface* to supply a given volume of steam; and a *slow* evaporation from the heating *surface* would result in no more injury to the sheets than a more *rapid* evaporation with larger water space.

An accurate account of the fuel used and the work done per mile run by each engine (tonnage hauled, grades, speed, etc., taken into account) would result in great economy of fuel. The same would be true in regard to other supplies, and the average condition of locomotives would be nearer perfect. It would be *demanded*, on the score of economy.

Another matter for investigation is the system and style of cars used for freighting. How can their durability be increased to such an extent that the additional cost of construction will still result in economy over the cost of the present style? In some particulars the common freight car is notoriously unworthy of the mechanical knowledge and judgment of railway managers—chiefest, perhaps, in the springs that carry the body. The body is carried on four points, while the *available* motion (vertical) of those bearings (springs) for carrying the body of the car without *twisting* it to conform to the vertical inequalities of the track, does not exceed ¼ of an inch ordinarily; consequently, *the body must conform to the line of the top of the rails* immediately under each of the four bearings by *twisting*. (The mountain will not go to Mahomet, therefore Mahomet must go to the mountain.) A little investigation would enable managers to understand why the body is so soon worn out, and the cause of leaky roofs, broken nails, loose boards (siding), loose braces, loose bolts, rods, and the general dissolution that occurs in four or five years' running; and how much more can be expended in springs of the requisite *motion*, or in arrangements that will make a car body practically center-bearing at one end (to prevent the twisting), and still result in *economy*.

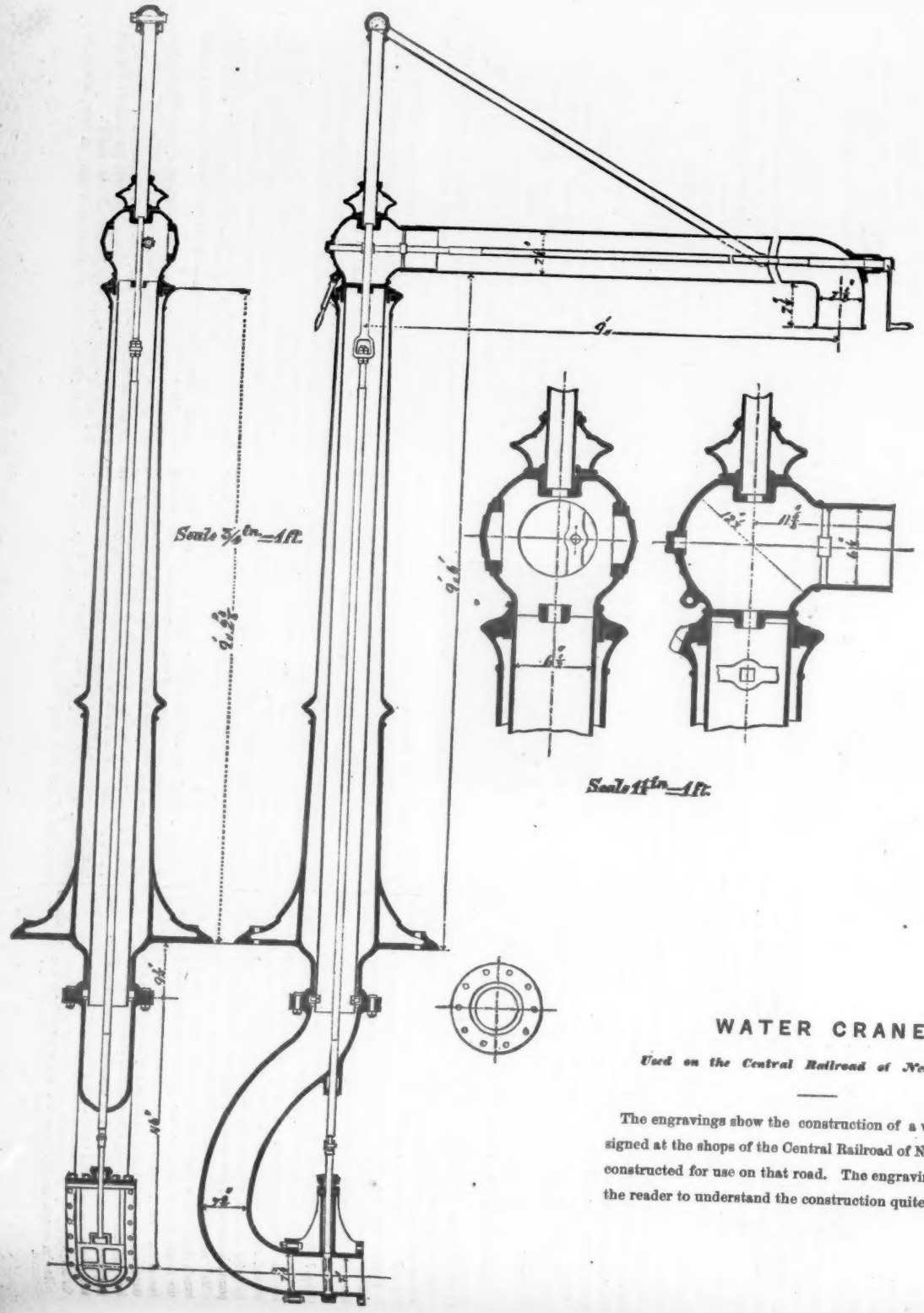
Another defect is in the strength of the draft arrangement. The long list of disasters, delays, and expenses, resulting each year from the weak and defective draft arrangement, drawbars, etc., if detailed would "even astonish the natives." When security in this particular can be assured under ordinary circumstances, at so small an additional cost, it is singular that this defect is not remedied.

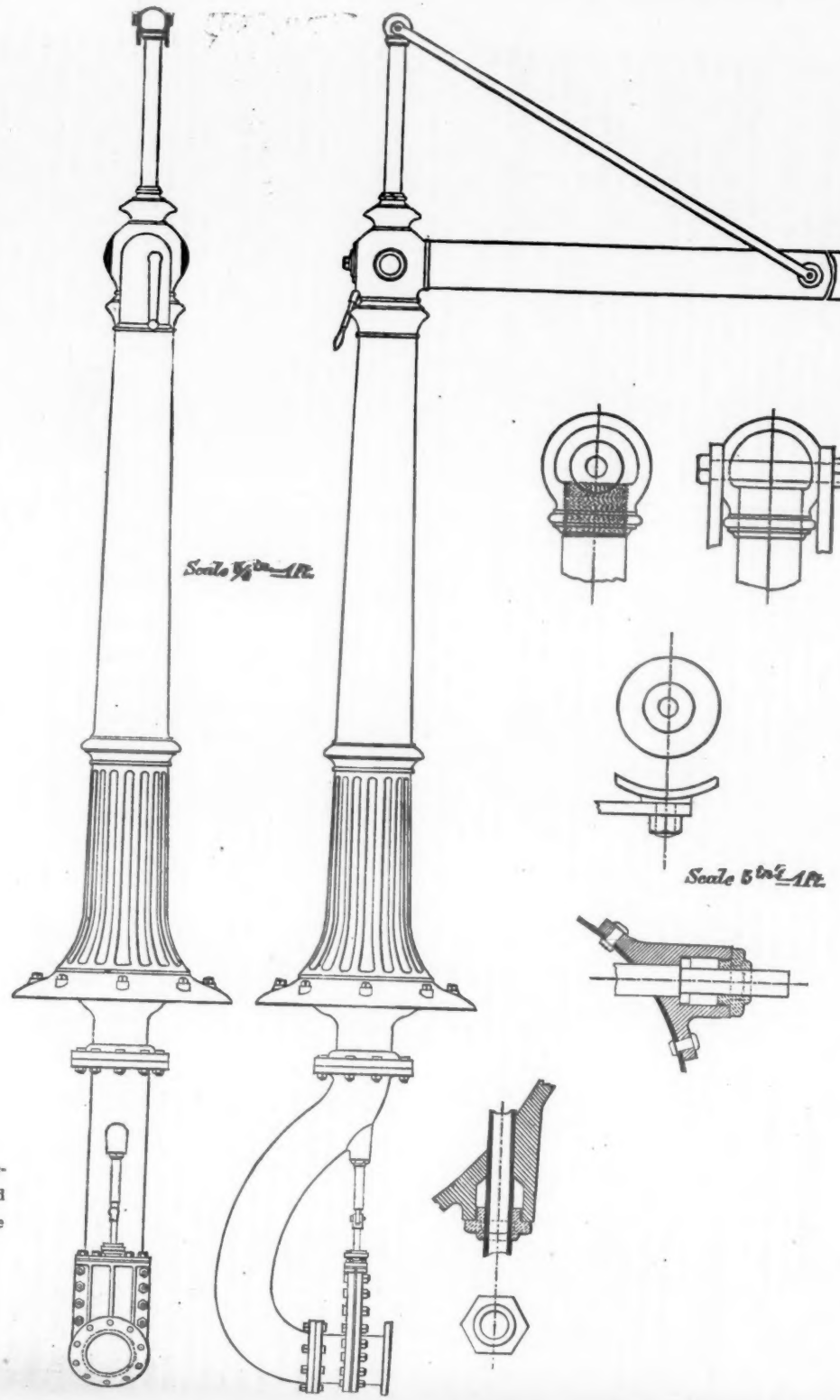
The link and pin, as ordinarily used, is equally deficient in strength, as the remains in scrap heaps along the roads will show. If links and pins are constantly breaking, it would seem to be wisdom and economy to increase the strength until breakage under all ordinary circumstances would not occur. That course is usual in other matters; why not apply it in this?

With a total car mileage on this road of about 900,000 miles per month, our average consumption of links and pins, to supply breakage and loss, will average over 7,000 lbs. per month, and from what I can learn of other roads, we are under rather than above the average in this respect.

Another defect in the proportions of cars, on many roads, is

*This letter, it is proper to say, is only part of one in answer to one in which certain inquiries were made.—EDITOR RAILROAD GAZETTE.





WATER CRANE

Used on the Central Railroad of New Jersey.

The engravings show the construction of a water crane designed at the shops of the Central Railroad of New Jersey, and constructed for use on that road. The engravings will enable the reader to understand the construction quite perfectly.

in the size of journals, (diameter and length). Seven inches long and not less than 3½ inches in diameter will be found to be *economy* over a smaller size, if tested. End play of journals should be as little as practicable, and if boxes next the hub of the wheel are made *thick*, so as to allow for the wear of the hub in the end thrusts of the wheels, and *close* enough when new to allow but about ⅛ in. lateral play between the box and hub of the wheel, they will, in my opinion, formed from experience and observation, give better results than are obtained under common practice. I could name roads that suffer in delays and expense fearfully on account of the excessive end play of journals, the collars cutting into the brasses as much as 1¼ in. at each end, reducing the bearing surface often to half the original length, the box being so far from the hub of wheel that the collars only are depended on to prevent lateral play. "Patent lubricants for cooling hot boxes" are always in demand on those roads.

Inquiry should also be made as to whether there cannot be more light thrown upon the laws of nature that come into play in the formation of the "chill" in a car wheel, so that we may be able to control it, or determine it, to a much greater degree of certainty than can be done by our present knowledge on this subject. Is it the result of chemical laws alone, or is it in part magnetic, or is it the law of crystals, such as are observed in the formation of ice, or the various crystalline substances of nature, that determine what we call "chill?" It seems to me that in this field there is a "golden harvest" awaiting the patient researches of some one competent to solve the mystery. We know that iron will "chill," but can't make the laws subservient to our will with as much certainty and uniformity as is desirable.

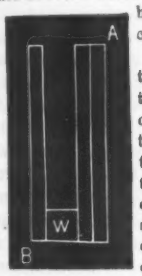
REUBEN WELLS, Master Mechanic,
Jeffersonville, Madison & Indianapolis Railroad.

A Problem in Hydrostatics.

TO THE EDITOR OF THE RAILROAD GAZETTE:

On the 525th page of "Trautwine's Pocket Book" is the statement that if the foundation of a pier be on rock covered with a layer of cement to prevent the infiltration of water beneath the masonry, the effective weight of the masonry below the water surface will not be reduced 62½ pounds per cubic foot, but on the contrary, etc.

Now this is probably not a "practical" question, for though a man might make a tie rod to an *A* frame twice as strong as necessary, he would hardly make a pier or dock wall one-half as heavy as he thought necessary, because he could lay the foundation in cement on rock.



It strikes me that theoretically there are two sides to this question; for suppose *AB* to be a vessel of indefinite height, and *w* a cubic block of any substance; let *h* equal the height of the water from the bottom of the vessel and *h'* = the height of *w*. Then the pressure of the water at the bottom will equal *h*×62.5, and the pressure of the water and block will equal $(h-h')\ 62.5+w$; there can hardly be a doubt but that if the specific gravity of *w* be less than 1, the two columns will be in unstable equilibrium, and the question is, if it will require the presence of a film of water under *w* to raise it?

N.

The American Society of Civil Engineers and its Policy.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As stated by the writer in a former communication (*Railroad Gazette*, Feb. 13, 1875), if the policy advocated by Mr. Croes is indeed that of the American Society of Civil Engineers, it is perfectly legitimate, whether advisable or not. But it is by no means certain what the policy of the Society really is. The views of the resident members only are, as Mr. Toots would say, "of no consequence," and it is greatly to be desired that a vote could be obtained from the whole Society. It is a good sign, therefore, to see these matters discussed in technical journals, so that they will be brought to the notice of all the members. Were the policy definitely settled, the tedious discussion on dangerous precedents and revolutionary proceedings might give way to some useful work at the meetings of the Society. At the last meeting the discussion of the Rapid Transit Report was postponed, to allow debate on the important questions, Is a resolution printed on the cover of a paper, printed at the head, and should a report, ordered to be published as a paper by subscribing members, have the names of the subscribing members appended to it? Whether these interesting questions are to be supplemented by others of equal importance to engineers, at the next meeting, will probably depend on the action of the revolutionary "half-dozen," who, according to Mr. Croes, are in favor of a policy tending "directly to the destruction of the Society." If these "half-dozen" members attend the meeting in sufficient force to lay resolutions and precedents on the table, there will be a chance to test the truth of Mr. Croes' statement, that it is "questionable whether any extended and valuable discussion will result;" but if not, it is certainly "questionable" whether any "discussion" whatever of the Report "will result." The principal object of this communication is to call the attention of the "half-dozen" to the importance of being present at the next meeting; but there are one or two other points to which brief reference may be made.

Mr. Croes does not appear to have completely defined the issue before the Society. In a paper read before the reception of the Rapid Transit Report, and in the subsequent discussion, it was intimated that some members were professionally connected with special schemes for rapid transit, so that the Society could not endorse any plan without embarrassing them. This view of the matter forms a part of the issue, and should be included in the consideration of the policy of the Society.

Mr. Croes speaks of engineers "peddling their wares," as if it were something disgraceful. Such action is by no means uncommon, even among the most reputable engineers, although it is not ordinarily characterized by so coarse a term as Mr. Croes has seen fit to use. For instance, when Mr. Roebling presented a plan for a bridge to connect Brooklyn and New York, Captain Eads, for the St. Louis Bridge, Mr. Chesbrough for a tunnel under Lake Michigan, Prof. Thurston, for a simple method of testing the materials used in construction, Mr. Evans, for a system of rapid transit, these gentlemen were not looked upon as peddlers, who resorted to unworthy means to gain "notoriety rather than reputation." It would not be difficult to extend this list considerably, and to prove conclusively that the best professional work is not always that for which the highest cash price is paid. Indeed, there is a suspicion in the minds of many that those professional men who only work for pay frequently do things for pay that more scrupulous experts would decline to consider on any terms.

It is true that the question of rapid transit, which is, perhaps, the most important engineering problem before this community at present, is one above all others that should be taken in hand by capitalists, who would pay engineers for the best solution. At the same time, while capitalists hold aloof, if professional men are willing to give their time gratuitously to the investigation of the problem, it is not by engineers, at least, that they should be condemned.

RICHARD H. BUEL.

No. 80 BROADWAY, NEW YORK, March 30, 1875.

Permanent Way.

The correspondence on permanent way now proceeding in our columns is by no means devoid of interest. It raises questions which, from time to time allowed to sleep, still come up at varying intervals for discussion. It will be seen that the main argument of our correspondents is that rail joints constitute exceptionally weak places in our iron roads. The fact has been commented on for at least fifty years; and since the introduction of wrought-iron rails—first used, we believe, on anything like an extensive scale, about 1823—hundreds of inventions—we do not exaggerate—have been produced to get over the difficulty. The problem is still unsolved, and it is apparently as impossible now as it has ever been to produce a system of permanent way which shall be as strong at the joints in the rails as it is elsewhere. Are we to assume, then, that the problem is insoluble? that, in short, it is simply impossible to devise a system of permanent way which shall be as strong in one place as it is anywhere else? We are slow to give an answer in the affirmative. On the contrary, we venture to think that the required system of joint may yet be devised; but it will certainly not be devised by any one who has not a most intimate acquaintance with the nature of the obstacles which he proposes to overcome. The most obvious way out of this difficulty is to scheme a system of fishing or otherwise supporting rails at joints in such a way that the joints can no longer be pointed out as localities of maximum deflection. Another method of arriving at the same end consists in so supporting the rails at the joints by the interposition of some structural element between them and the ballast that deflection will be reduced to an extremely low limit. The third arrangement is embodied in a system of construction which is intended to eliminate joints altogether. It will not be uninstructive to glance at the results which have been obtained in practice from the working of all three systems.

The most obvious, the most crude, the most popular and convenient, and possibly the least expensive device that can be included under the first division of our subject is the well-known fish joint. In a way fish joints answer their purpose so well that they are universally adopted on cross-sleeper lines. If rails were very deep, and square under the heads, the fish joint would leave little to be desired. As it is found in practice, with a depth in the fish plates of about 2¼ in., and with anything rather than a square groove for the fish plate to lie in, its operation is very far from perfect, and it is well known that the best ordinary fished joint has less than one-half the strength or power of resisting deflection of the rail proper. But this is not the worst of the fish joint. If it were, then by putting the sleeper under the joint some advantage would be gained; but this plan has been tried, and without in any way improving the road. Deflection might, to a certain extent, be diminished by the use of joint sleepers, but they would not cure that disagreeable thumping with which we are all perfectly familiar—the audible manifestation of the concussion to which rolling stock is subjected. When a heavily loaded wheel is caused to run along a rail, it will be found that the rail proper continually deflects under the insistant strain, and this deflection is continually transmitted onward in advance of the wheel, the rail assuming a curve in a vertical plane, of greater or less length. When the wheel approaches a joint, however, the curve is rudely broken; the fish plates are unable to transmit the wave of deflection forward in advance of the wheel, and the result is that the rail on which the wheel is not stands a little higher than the end of the rail on which it is. The wheel encounters the higher end of the opposing rail with a certain amount of concussion. The end of the rail is by degrees hammered into fibres, and a jerk is given to the wheel and springs quite perceptible in a first-class carriage, and severely felt in heavily-loaded goods wagons, which always have bad and stiff springs. The defect in the fish joint—assuming it to be in perfect condition—is that it lacks the power to transmit the wave of deflection from one rail to the next. Is it possible to overcome this objection? Two primary causes operate to bring about the deflection of the fish joint. The first is lack of vertical stiffness in the joint itself; the second is want of stiffness in the mode of attaching the fish plates to the rail. Now, the first objection can be overcome, because we may easily give any amount of vertical depth we think proper to a pair of fish plates by carrying them down below the rail. This device has been patented over and over again, and is now being adopted in a modified form by Mr. Tomlinson, on the extension of the Metropolitan Railway from Mooregate street to Bishopsgate street. No doubt some advantage is thus obtained, but it is not great. We have still to screw the fish plates to the rails by four bolts, and it is simply impossible by any system of bolts to so secure the fish plates to the rails that the former will not work on the latter under the tread of a heavy engine. Sufficient surface is not and cannot be provided. It may be shown that a certain depth of fish plate exists, the stiffness of plate proper to which will just balance the resisting power of the bolts, and of the grooves in which the plates lie, and that if the depth be exceeded nothing whatever is gained in return for the increased cost; and it is probable that this limit is very nearly reached with the ordinary 2¼ in. or 2½ in. fish plate. Indeed, a little reflection will show that if instead of an ordinary pair of fish plates we used a girder 18 in. long and 18 ft. deep, the joint would still constitute a weak place, because the rails, from the way in which they must of necessity be united to the fishing girder, would be unable to avail themselves of its stiffness, although that would be infinite as compared with even the solid section of the rail. It follows that no augmentation of depth in a fish plate, unless it is accompanied by some improved method of securing the plates to the rails, can do much good in the only way required, that is to say, in permitting the requisite transmission of the wave of deflection from one rail to that next succeeding it. Inventors have been alive to this fact, and various devices have been employed to supplant fish bolts; but we may state here, for the benefit of any of our readers who may feel disposed to give their brains a little exercise over this problem, that no device which consists in clipping the rail or its lower table tightly has been found to answer. In all cases the rails work loose in clipping fishes, and we have no reason to think that the problem can ever be solved in this way. In one word, our conviction is that no system of fish plates alone can be devised which will permanently fulfill the required object. The problem to be solved consists not in devising a good fish plate, but in devising a satisfactory method of securing fish plates to rails, so as to become continuous with the bars to which they are fixed.

If we turn now to the second device, which consists in supporting the rails from below without the aid of fishes, we shall find that in practice the results have been no less unsatisfactory. One example of this system may be found on the Great Southern & Western Railway of Ireland. This line was laid with a rail of excessive weight—something like 90 lbs. to the yard—and on cross sleepers, and of course without chairs. The joints were supported on sleepers, or rather slabs of timber, frequently sawn out of beech, elm or ash butts, and as much as two feet wide. The theory was that these great sleepers would prevent deflection in the ends of the rails, and therefore that the presence of joints would hardly be felt. But the designer of this road—which we select simply as a type—forgot all about the wave of deflection, and in practice the rail was carried down under the leading wheels of the engines, and with it the slab; but the slab could not carry down the next rail, which was only spiked to it. And thus the opposing rail, drawing the spikes, stood right up off the joint sleeper, and nothing but incessant attention, and packing up and spiking down, kept the road fit for work. The unusual weight of the rails and the comparative lightness of the traffic have rendered it possible to perpetuate a vicious system in this case. It is worth notice that the stiffness of the line at the joints was nearly as great as anywhere else, although the road was, and we believe is, really very bad. That is to say, if under the tread of an engine a deflection of say 3-16 inch was measured at any place in the length of a rail, then it would be found the same rail did not deflect more than 3-16 inch at the end. But then the next rail did not deflect at all, but stood up 3 16in. higher than its fellow; and we need not stop to explain what the result was. In a word, each length of rail acted for itself, and at thirty miles an hour, it was impossible to converse in a carriage if one of the windows were open, such was the noise. The device was ingenious and simple enough, but it would not work. Then spikes at the joints were abandoned in favor of nuts and bolts, but the bolts could never be kept tight. The nuts got loose, and the bolt heads worked into the wood; and, besides, the joint sleepers or slabs, in spite of their tremendous width, "tipped" under the rails. It may be taken for granted that this system is worse than the worst that is possible with a fished road. Attempts have been made to carry out the principle in another way, joint chairs being used in which the ends of adjoining rails rested; but this scheme has totally failed, simply because the chair has always been unable to carry down the unloaded rail end with the loaded end, and the keys always worked loose. Indeed, instead of two long fish-plates of iron, we have under this system a short fish-plate of wood in the shape of a key. One enterprising inventor went so far that the rail ends were placed in a chair the socket of which was much too large for them, and six or eight pounds of molten cast iron from a portable cupola were poured in. In this way a very good job was made. The rails were virtually welded into one, and the wave of deflection was properly transmitted; but the cost was excessive, and besides there was the fatal objection that it was all but impossible to take a worn rail out and replace it with a new one. The scheme, therefore, never went beyond the experimental stage. Before going further, it will be well to explain even more fully than we have yet done, that what is required in a rail joint is not so much that there shall be moderate deflection at a joint, as that the rail ends at both sides of a joint shall deflect equally. If a road were absolutely rigid, then all that would be needed to make a good joint would be to put a support under that joint. If the rail ends were carried in a double chair, the thing required would be obtained. But this is not what is wanted. The joint, whatever it is, must be so contrived that if one rail end descends—as it is certain to do—the other rail end shall descend equally, and no more. A practical example of the advantage which follows from securing this end, even indirectly, is supplied by Mr Stirling's bogie express engines. These engines carry something like 15 tons on their 8 ft. driving wheels, yet they are remarkably light on the road. The four wheels of the bogie are close together, and when crossing joints they are near the rail ends, and the front wheel, so to speak, carries down the rail for the next following wheel, and consolidates the whole track for the driving wheels. We venture to think that no one has yet devoted sufficient attention to this question of the transmission of deflection in advance of the coming wheel. All attempts have been directed to scheming rail joints to give stiffness, and that alone; whereas stiffness is a matter of secondary importance as compared with keeping the upper surfaces of the rail ends dead level with each other.

The third system of construction, which proposes the practical elimination of joints, may be dismissed very briefly, as for some cause it has never come into extended use. It was adopted—although it did not originate with the late Mr. Peter Ashcroft—on the Southeastern Railway. The rail is compound, and consists of two angle-irons laid side by side with a steel T-piece bolted between them, the angle-irons break joint with each other and with the central table, so that virtually there is no complete joint, or, more strictly speaking, three-thirds of a joint take the place of one whole joint in a given length of road. The system works well and gives satisfaction, but it is not free from defects, the principal being that for a considerable weight of metal the whole vertical stiffness of the road is small.

A review of all the systems that have been adopted for strengthening rail joints would fill a large volume, but it will be found by those who will do as we have done, and devote a little time to mastering the history of the subject, that promising inventions have failed because of difficulties which only extended experience in the working of railways could have suggested; and it will be seen that almost without exception designers of joints have sought for nothing but stiffness, and that they have totally omitted to secure the essential on which we have insisted—the transmission of the wave of deflection unbroken over the joint. If attention be paid to this point, we think it possible that a system of permanent way may yet be devised which will be, if not perfect, yet much superior to any now in use.—*The Engineer.*

—Mr. John C. Da Costa, one of the first projectors and for many years a director and large stockholder of the Camden & Atlantic Railroad Company, died in Camden, N. J., March 22, aged 74 years.

—Mr. H. M. Britton retired from his position as Superintendent of the Whitewater Valley Railroad, April 1, at which time the road passed into the hands of the Indianapolis, Cincinnati & Lafayette Company.

RAILROAD GAZETTE

Published Every Saturday.

CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

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Editorial Announcements.

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

THE CHICAGO, BURLINGTON & QUINCY RAILROAD.

The Chicago, Burlington & Quincy (which has had trials in its day, however,) is probably generally considered the most successful of Western railroads. It would be hard to find anywhere a larger district of almost uniformly fertile and cultivated country than that through which its main lines and branches pass. Probably nowhere in the country is there a larger production of grain, cattle and hogs per square mile of area than just here. Since it was built, too, coal mines have been opened at several points on its lines, and, the land having been generally utilized for agriculture, for a long time past the towns on its lines have been growing with great rapidity, and there is no line in Illinois which has stations at so many large towns. The three largest cities of the State—Chicago, Peoria and Quincy—are all reached by the Chicago, Burlington & Quincy, while it has on its lines such places as Aurora, Ottawa, Galesburg, Macomb, Princeton, in Illinois, and Burlington, Keokuk, Ottumwa and Council Bluffs, in Iowa. It could hardly have been better placed to secure local traffic, and it has secured exceptionally good connections for through traffic. It was the first and for some years the only road commanding a through rail route from Chicago to Kansas, and not long after the opening of the Union Pacific it completed a short connection with that road, and there is a whole system of roads in Nebraska and Kansas which are controlled by nearly the same parties as those who direct the Chicago, Burlington & Quincy, which probably gets the largest share of their through traffic. Only a little more than a year ago it became the chief Chicago outlet of the Missouri, Kansas & Texas road, and so was brought into close connection with Texas, and for a long time part of its road has formed the Chicago outlet of the Iowa lines and some 150 miles of the Dunleith line of the Illinois Central. It reaches the Mississippi at six points, and has trains running through to two others, and its trains run to the Missouri River at Council Bluffs, Plattsmouth, Nebraska City, St. Joseph, Atchison and Kansas City. So to its resources for local traffic it adds advantages for through traffic such as are excelled by no railroad west of Chicago. Its western connections, too, penetrate the most rapidly growing districts of the Northwest, so that its future promises an increase of business only surpassed by that of its past.

Any examination of the growth of traffic on a railroad like this is complicated by the growth of the road itself. In 1865 this company worked but 394 miles of road; now, 1,264. The additions, except the 300 miles of road across Iowa, have been entirely of branches which, however successful and profitable they might be, could not in the nature of things equal the main line in earnings per mile. Indeed, there were many of them only valuable to the company as contributors to the traffic of the main line, and some, doubtless, have been acquired more to prevent their injuring the old road than with the hope that they would be directly beneficial. Since 1868 the road has grown from 403 miles—more than trebled in length. In that time the passenger traffic has increased nearly 115 per cent. and the freight traffic 236 per cent., or, counting a passenger-mile equal to a ton-mile, the whole traffic has increased from 172,216,800 passenger and ton-miles in the year ending April 30, 1868, to 531,042,545 miles in 1874, the road having increased as above. Here the proportions of increase have been 214 per cent. in road and 208 per cent. in traffic—nearly equal, after all, we see. If we compare earnings they tell a different story, for while traffic has increased so enormously, rates have decreased very largely, and the percentage of increase in earnings is but 89 per cent. The increase in capital has been very nearly 200 per cent. (199.6), and if the proportion of working expenses remained the same, and the increase in capital had required as large an average rate of interest in 1874 as in 1868, the company evidently would not have been able to maintain its position. The proportion of working expenses has increased, with the reduction in rates, from 50 to 53 per cent., but the increase in capital has been much larger in bonds, chiefly bearing 7 per cent. interest, than in stock, which is paid 10 per cent. The increase in stock has been 112 per cent., and in bonds 399 per cent.; the whole capital having doubled, the bonded debt has quintupled. If the increase had been the same in stock as in bonds, while $800,000 per year less than at present would be required to pay interest on bonds, $1,100,000 more would have been required to pay 10 per cent. dividends on the stock. Thus the company has been able to keep up its rate of dividends by making 9 or 9½ per cent. on investments of money borrowed at 7 and 8 per cent. The average profit on the capital invested has meanwhile decreased greatly—from 17 to 9½ per cent.—but in 1868 that profit was exceptionally great, and the proprietors could hardly have hoped to see it maintained in the future. A summary of the progress of the company, in capital, interest and dividends, traffic and gross and net earnings, for the six and two-thirds years from April 30, 1868, to December 31, 1874, is given in the following table, in which the figures for the earlier year are taken from "Poor's Manual":

	1874.	1868.	Increase.	P. c.
Capital stock	$26,639,013	$12,544,030	$14,094,983	112
Funded debt	27,381,075	5,488,750	21,892,325	399
Total capital	$54,020,088	$18,032,780	$35,987,308	200
Ten per cent. dividends	2,663,901	1,254,030	1,4 9,498	112
Actual interest charge	1,958,892	363,555	1,595,337	439
Mileage	1,264	403	861	214
Traffic (ton and pass. miles)	531,042,545	172,216,80)	358,825,745	208
Gross earnings	$11,645,317	$6,154,647	5,490.670	89
Net earnings	5,463,803	3,087,482	2,376,321	77
Percentage of net earnings on total capital	9.5	17.1		

This shows, certainly, that the financial strength of the company is not nearly so great now as it was seven years ago. Then but little more than 30 per cent. of the capital was represented by bonds; now more than 50 per cent. is. Then the net earnings were 17 per cent. on the total capital; now they are 9½ per cent. It remains none the less true, however, that the company is still in an exceptionally strong position, and is one of the solidest properties in the Northwest; its position for commanding traffic under any fluctuations of rail and lake rates and its constantly growing business rendering it even stronger than its accounts make it appear to be. The proportion of net earnings to capital has improved of late years, as the following will show:

Year.	Percentage.	Year.	Percentage.
1867–68	17.10	1871–72	9.17
1868–69	18.31	*1872	9.35
1869–70	13.33	1873	9.51
1870–71	10.67	1874	9.50

*Eight months ending with December; the percentage is averaged for a year.

Thus, though the net earnings do not approach the percentages previous to 1871, they have increased somewhat since 1871-72, notwithstanding the vast additions made to the capital by the acquirement of the branches and the Burlington and Missouri River Railroad.

Those who have had little experience in permanent railroad investments are likely to look upon this decrease in the rate of the returns on the capital as, whether avoidable or not, very unfortunate for the proprietors. This would be true if there had been no increase of capital meanwhile, but as the facts stand, not it but the contrary is true. If a man has ten thousand dollars invested in a business which pays him 20 per cent. profit, he finds advantage in an enlargement of the business so as to employ fifty thousand dollars, though the profits are reduced to 12 per cent. He can get money for 7 per cent., and his profit of six thousand on his enlarged business, after paying $2,800 for interest on the forty thousand added to the old capital, remains $3,200, and his income is greater by twelve hundred dollars than if he had maintained the old rate of profit on the old business. This is just what has occurred with the Chicago, Burlington & Quincy proprietors. They have had frequent opportunities for making new investments which return more—some of them much more—than the usual rate of interest. And when railroads, and most other large public business enterprises, have become extraordinarily profitable, this extension of investments is usually the only way by which the prorpietors can keep good their position. The extraordinary rate of profit can hardly ever be maintained; it attracts competition, and, in the case of a corporation serving the whole public, bitter enmity. In railroads the policy then is to enlarge the business by the use of new capital whenever more than the market rate of interest can be earned on that capital. Such an enlargement, however, also frequently becomes necessary in order to save the old investment from great depreciation or destruction, and should then be made (if the money can be got), even if it does not return ordinary interest—as has been done of late years on more roads than one; but the Chicago, Burlington & Quincy has not had to meet such exigencies. The opportunities which this company's stockholders have had have been numerous, and so far as the enterprises connected directly with the road are concerned—the new roads which it has built or leased—have been uniformly advantageous; and there is probably no better satisfied body of railroad proprietors in the United States. Many of them, doubtless, have lost a great deal of money in enterprises which their directors, or some of them, have recommended—railroads in Iowa, Missouri and Kansas which were expected to be of some value to the Chicago, Burlington & Quincy as feeders—but the company's own enterprises have been on the whole very profitable to those who invested in them.

This may seen like ancient history. We are not accustomed to look back with steadiness over so extended a space as seven years in a railroad's history; and in these days the first question asked of a company, and frequently the only one, is, How did it stand the panic? Wonderfully well, must be the answer for the Chicago, Burlington & Quincy; it has increased its traffic, nearly maintained its rates, and increased its profits slightly (though not the rate of profit on its investment) through one of the most trying years railroads have known. Indeed, it can hardly be said to have been a trying year for the Chicago, Burlington & Quincy. In fact, the road is one less likely than most others to be affected by temporary disasters, failures of crops, low prices and the like. It is a great wheat road, though inferior to some others in the Northwest, but the failure of wheat on its lines may not prevent an increase in traffic. It is the greatest of corn, hog and cattle roads, and though the failure of corn is always a great misfortune to it, the hog shipments depending largely on the corn crop, yet with a good wheat and grass crop and plenty of cattle, it does well when there is little corn to carry. And, as its traffic comes from Southern Iowa, Northern Missouri, and nearly all Nebraska and Kansas, and to a considerable extent even from Texas, as well as from Northern Illinois, which was once its sole field, the failure of crops must be a very wide-spread one which does not leave some of its territory with good harvests. In Illinois, too, the coal traffic and the manufactures of the towns on the line have acquired immense importance, and are now the chief sources of the growth of traffic in that State, as they are and for many years have been on most of the railroads in Northern Illinois, where there is little or no growth in the farming population, but a great one in the towns and villages.

It is not probable that, for a long time to come at least, this company will again engage in an extensive work of extension. It occupies its field very completely in Illinois, and with some extension of second track on its main lines will be able to accommodate any probable growth of traffic on them. It will probably find it to its advantage in the course of a few years to construct some new branches to its Iowa line, where the country is now thinly peopled and able to quadruple its production when there are hands enough to cultivate it. But for some years to come we may expect its chief expenditures on capital account to be for renewing track with steel, second tracks and sidings, additions to the rolling stock, and other improvements to enable the existing lines to carry a heavier traffic at less than the present cost.

In all our calculations concerning the company we have spoken of the lines which it works as all its own property. This is not literally true, as most of the branches have distinct organizations, as has the Burlington & Missouri River road, but the contracts by which these roads are worked make them substantially part of the lessee's property. It is liable for all the interest on the funded debts, owns most of the stock of the branches and pays dividends on the Burlington & Missouri River stock equal to those on its own; and in our statements of capital we have added the stock of both companies on which dividends are payable, and the bonds of all.

The comparisons of the results for the two years past will be found in our summary of the report. The progress made is, briefly, an increase of 3.25 per cent. in the capital, of 5.22 per cent. in traffic, of 2.10 per cent. in the gross earnings and 3.25 in the net earnings, and a profit on the whole capital of 9.50 per cent. in 1874 against 9.51 per cent. in 1873.

THE GREATEST BRITISH RAILROAD.

A paper was recently read before the Institution of Civil Engineers to show the difficulty of working a railroad crowded with traffic, in which the London & Northwestern, the most important of all the British railroads, and perhaps the road with the heaviest traffic in all Europe, was taken as an illustration. The data given concerning it in this paper were by no means complete, but they will enable us to make some interesting comparisons with a leading American railroad. We have taken all the roads worked by the Pennsylvania Railroad Company directly to compare with the English road, as thus we more nearly approximate to the mileage of the latter, and besides it might be unfair to compare the best part of the Pennsylvania system with the whole system of the London & Northwestern, which may, for aught we know, have some lines with comparatively light traffic.

One of the most interesting matters to note is the train work which the most crowded roads in the world have been able to do on two tracks, with plenty of sidings. In England only recently do people (when there is a great accident) begin to talk of the necessity of providing separate tracks for freight, so we may conclude they have not yet passed, though they may have reached in some cases, the limit of capacity of double-track roads. The London and Northwestern has begun the construction of separate freight tracks already. Our roads with heaviest traffic have felt sometimes that they were likely to pass that limit before they could provide additional tracks, and one has already provided them.

The following is a comparison of some of the facts concerning the two roads, the Pennsylvania for the year 1873, the English road for the year ending six months later:

	Pennsylvania.	London & Northwestern.
Miles worked	1,5.3	1 960
No. of locomotives	1,071	1,935
No. of passenger-train cars	847	2.722
No. of freight-train cars	20,649*	39.581
Passenger-train mileage	6,386,298	14,460,568
Freight-train mileage	17,113,238	16,097,954
Total train mileage	23,499,536	30,588 922
Train mileage per mile of road	15,531	15.591

The last figures show that the two roads are almost equally crowded with trains, the London & Northwestern having less than 0.4 per cent. the most trains per mile of road. That the trains are similar in size we cannot say, but, judging by the weight of the English company's locomotives, they do not do more work than the Pennsylvania's. These weights are reported to be from 27½ to 31½ (long) tons for passenger engines, and 29½ tons for the heaviest coal trains. The maximum "goods" train is reported to weigh 292½ tons and to consist of 45 "wagons," which gives 7½ short tons per "wagon." Sixteen of our cars fully loaded would make such a weight. English freight trains, as well as passenger trains, run faster than ours, however.

As to the amount of work done, there are no sufficient data from the London & Northwestern, which, like other British railroads, reports the number of tons and passengers transported, but not the distance they were carried. The number of each is as follows:

	Passengers.	Tons of freight.
Pennsylvania	15,057,153	15,647,509
London & Northwestern	42,511,777	27,208,042

Doubtless the London & Northwestern has much the largest passenger traffic, though not to the extent indicated by these figures, for it has by no means so large a long traffic as has the Pennsylvania; but the difference in the average distance hauled must be very great in the case of freight, the Pennsylvania having a great stream of traffic which passes over the entire 444 miles between New York and Pittsburgh.

To ascertain the capacity of a road, however, we must examine its most crowded part; and it is not an average of a score or two of different lines that will enable us to know the greatest number of trains that a railroad can pass over its tracks. In the paper referred to, however, the section of road from London (Euston station) to Rugby is given as an example of the heaviest traffic—a section 83 miles long. On this section the following trains ran *through:* 30 express mail trains at 40 miles an hour; 5 at 36 miles an hour; 29 passenger trains at lower speeds and stopping at all stations; 32 express goods trains at 20 to 25 miles an hour; 27 ordinary goods trains, and 23 local goods and mineral trains—a total of 64 passenger and 82 freight trains.

The Pennsylvania Railroad runs over the 90 miles of its "New York Division" (New York to Philadelphia) 30 through passenger trains daily, (15 each way), and in an ordinarily busy season about 40 freight trains of about 30 cars, carrying ten tons each. The size of the trains, of course, makes all the difference possible in the bulk of the traffic, but it does not, after all, make much difference in crowding the road. If terminal facilities and sidings are adequate, about as many long as short trains can be passed over a road. The Pennsylvania's trains on this division of its road appear to be nearly twice as large as the London & Northwestern's *average* freight trains, but they must also be considerably larger than the Pennsylvania's average trains, as this is probably its easiest division.

There should be some better collection of information than now exists concerning the maximum capacity of single and double tracks as proved in practice on different railroads, with such information as to the complexity of the traffic as will enable one to make comparisons. Many of our roads have been forced to provide second tracks, and some still more for parts of their lines; but we have nowhere seen accounts of the actual bulk of the traffic which finally broke the back of the single or double-track road.

* 3,501 cars owned by other companies and individuals (chiefly fast-freight line cars) run regularly over the road.

Foreign Railroad Notes.

Under this head we have collected some notes and observations gathered and made chiefly in reading various foreign railroad and technical journals which have reached us within a few weeks past. Some of these notes are bare translations, and others contain comments on the facts recorded, as the reader will see; and the variety of subjects is such that no less general title than the one we have given would cover them all.

On the Royal Hungarian State Railroad in 1873, the proportion of first-class passengers to the whole number was but 1.1 per cent., of the second class 13.5, of the third class 30.6, and of the *fourth class* 54.8 per cent. It was thought that there should not have been so many more fourth-class than third-class passengers, and the cause is said to have been that there was too little difference in comfort between these two classes of cars, and on this account it has been decided to change the newer fourth-class cars into third-class, and to use freight cars for the fourth class, provided with seats and warmed. Formerly (and perhaps now in some parts) German fourth-class cars had no seats.

The Austro-Hungarian railroads have a clearing house for interchanged cars, situated at Pesth. The estimate for its expenses in 1875 is a little less than $3,000, which indicates that the employes are not paid munificently.

A committee of representatives of railroads terminating at Vienna has been constituted for the purpose of studying the causes of the railroad accidents that may occur, proposing measures to obviate them, and preparing statistics of accidents. The Hungarian Ministry of Communication has decided on establishing a commission of representatives of Hungarian roads for the same purpose.

Mr. F. Pupka, an engineer at Vienna, writes to the German *Organ for Railroad Progress* of some experiments made by Mr. A. Feldbacher, Engineer of the Austrian State Railroad Company, on lining locomotive boilers with sheet copper to prevent accumulations of incrustation. Of the three plates forming the bottom of a locomotive boiler, the two at the ends were covered with sheet copper one millimetre (1-25 inch) thick, the middle one being left bare. This engine was run two years, making a distance of about 14,000 miles in switching service in the Vienna yard, where the water is the worst on the line. On removing the boiler tubes, a layer of incrustation was found 10 millimetres thick on the iron surfaces and two to three millimetres on the copper; the iron exhibited corrosions 1⅛ millimetres deep; the copper maintained a perfectly smooth surface, while the iron under the copper had the appearance of new plate. The structure of the incrustation was coarser grained on the iron than on the copper. The cost per boiler is given as $50 to $150.

Mr. Kupka summarizes the advantages of this practice as follows:

1. The life of the boiler is increased two or three times, and extraordinary security against explosions is obtained.

2. There is considerably less incrustation on the smooth surface of the copper than on the porous and somewhat oxydized iron or steel, and therefore a better generation of steam and utilization of fuel.

3. The boiler plates may be thinner without danger, in consequence of the favorable action of the copper in preventing corrosion, and consequently the weight of the boiler may be less.

4. The joints of the plates are made perfectly tight by doubling the thin copper sheets over the iron plates and riveting them in.

5. There is a considerable saving in boiler repairs.

A great many inventions of car couplers are made in Germany now, in competition for the prize offered by the German Railroad Union. Most of them are not automatic couplers, however, but are intended simply to enable the workman to couple without going between the cars, which in Germany have a buffer on each side.

The "Prince Henry Railroad Company," of the Grand Duchy of Luxemburg, has obtained concessions for three lines, one or which is described as "an American road from Wallendorf to Vianden."

The Railroad Department of the German Empire has lately published a report of the accidents occurring on the railroads of the Empire, exclusive of those in Bavaria. For the month of December there were 319 accidents; 187 of them derailments, 112 collisions, and 100 other accidents in the working of the roads. There were 249 persons killed and injured as follows:

	Passengers.	Employes.	Others.	Total.
Killed	2	37	10	49
Injured	10	179	11	200
Total	12	216	21	249

There was one person killed or injured to every 1,465,940 miles run by an axle—axle miles, as the Germans say, which is their ordinary way of expressing a unit of train service. Most of their cars have only two axles, but some have three; and nearly all engines have more than two; so an injury to 730,000 miles run by cars and engines would probably be a little too favorable statement, which is so bad as to incline us to be reconciled with our frightful February report of 211 train accidents. A single road had 16 derailments, 20 collisions, and 96 greater or lesser injuries to vehicles.

In a pamphlet on "German Railroad Politics," published in Berlin in 1872, Dr. F. Perrot says that descriptions had been given, in a work on the methods of lubricating car axles, of more than 100 constructions of axle-boxes actually used in Germany, and the greatest variety of axle-journals and bearings. The consumption of oil per axle-mile in some of these was not less than a hundred times as great as in others! One of the large German companies, having used in 1862 about $25,000 worth of oil for car-axles, introduced an improved apparatus and a system of premiums to the brakemen who oiled the cars for economy in the use of lubricators. Within four years (having a considerably greater axle-mileage than before) the saving amounted to more than $85,000.

The number of men employed on British railroads is said to be about 300,000. Of the whole number in 1876, 773 were killed and 1,171 injured.

English journals report a trial of the Westinghouse vacuum brake, March 2, which was very successful, a train running 43 miles per hour (engine and 10 cars) being stopped in 452 yards and 33 seconds on a down grade of 60 feet per mile, and again in 110 yards and 18 seconds at a speed of 25 miles an hour on an up grade of 50 feet per mile.

An English paper gives the following as the total staff of employes in the service of the railroads of the United Kingdom. It is probably for the year 1873, but no date is given with the list:

Secretary's department	863
Traffic department	106,741
Locomotive department	82,854
Engineer's department	59,542
Storekeeper's department	2,103
Police department	1,610
Accountant's department	2,149
Telegraph service	2,672
Steamboat service	3,132
Miscellaneous	13,064
	274,730

Ten-elevenths of the whole force are in the traffic, locomotive and engineer's departments. Of these, the traffic department had 39 per cent. of the whole force, the locomotive department 30 per cent., and the engineer's department 21⅛ per cent. The number of employes per mile of road was about 17.

Paternal government could hardly further go than has been seriously proposed in Germany in advocating a law prohibiting the investment of German capital in foreign securities. Arguing against the proposition, the *German-American Economist*, of Frankfort, says: "To-day the two richest nations of Europe, Great Britain and Holland, are also those whose money markets have taken the most and the most various material in foreign securities." It also ventures to say, as at least approximately correct, that the profits realized in Germany on the several hundred millions of United States 5-20 bonds bought at ridiculously low prices during the war equal all the losses on Spanish bonds and those of the bankrupt American and Austrian railroads.

The Railroad Department of the German Empire reports the accidents for the last half of 1874 on all the railroads of the Empire except those of Bavaria (which are not under the jurisdiction of the Department). The length of the railroads in operation was 13,640 miles—about a fifth of the mileage of the United States. On these there were during the half year 1,408 accidents, 608 of which were derailments and 478 collisions. By these accidents 285 persons were killed and 992 injured. Ten of the killed and 59 of the injured were passengers; 195 of the killed and 852 of the injured were employes, and 80 of the killed and 81 of the injured were other persons. No less than 62 persons attempted to commit suicide on the roads, and 57 of them were successful. One passenger was killed to 64,329,247 axle-miles of passenger and mixed trains (something less than half that number of car-miles) and one was injured to 10,893,262 axle-miles of the same trains. One road killed or injured a person for every 796,886 axle-miles, which is about equivalent to about 31,875 train-miles of a train of five American cars.

A German railroad officer proposes a radical change in the method of selling round-trip and excursion tickets at reduced rates. He says that most travellers on any extended route desire to vary from the route selected originally for some cause or other, and many do so and lose part of the tickets. On the other hand, the settling of routes and rates, and the calculation of shares due each company require much time and expense, so much so that the business often costs more than it comes to. He proposes that hereafter the companies do not sell tickets for such journeys at all, but offer instead orders for various amounts payable in tickets at their face value on presentation at any ticket office of any of the roads parties to the agreement, but sold at various discounts, according to the length of the journey or the time within which it is to be made. Thus a little book of such orders, accompanied by the photograph and signature of the buyer, might have leaves representing ½, 1, 2, 5, 10, 20 marks or guiden, or, instead, 5, 10, 20, 50, 100 miles. One for 2,000 miles journey might be sold at a discount of 10 per cent., if good for only six weeks, of 7½ per cent. if good for two months, and of 5 per cent. if good for three months, and a farther reduction of 5 per cent. might be made for every addition of 625 miles (1,000 kilometres) to the distance, up to a maximum of 30 per cent. Thus a ticket for 7,000 kilometres (about 4,350 miles), good on any or all of the lines of the companies agreeing to their issue, might be sold at a discount of 30 per cent. from the regular fare if it was made good for only six weeks, at 27½ per cent. discount if good for two months, and at 25 per cent. if good for three months.

The London *Times* cautions investors who are expecting the English railroads to make larger earnings than heretofore for their shareholders. It says that although in the future traffic will doubtless increase, and the working expenses of the roads will somewhat diminish as they get the advantage of the great fall in coal and iron within the past year and a

half (which have not yet had much influence on expenses because of the custom of the companies to make contracts for long periods), yet the increase in the traffic will require large expenditures on capital account, and the freight rates, which were raised materially before 1873, when business was best and prices highest, cannot be maintained, but will have to be reduced to suit the changed condition of things. It regards the construction of separate tracks for freight (which the London & Northwestern has already begun) as inevitable on the leading lines at no very distant day.

Recent lettings of contracts for Bessemer rails in France have been made at the rate of $62.75 per ton of 2,240 lbs.—equal to $73 per ton in our currency at the present price of gold. Third-class four-wheeled passenger cars were let at $775 each, Martin steel locomotive tires at four cents a pound; car-axles at 4·4 cents per pound; spiral springs at 10.4 cents per pound, and freight cars at $290 each—all in gold.

Record of New Railroad Construction.

This number of the *Railroad Gazette* has information of the laying of track on new railroads, as follows:

Buffalo & Jamestown.—Extended from Dayton south by west 9 miles to Cherry Creek, N. Y.

THE NEW MISSOURI RAILROAD LAW (which at this writing the Governor has not signed, however), an abstract of which we give this week, is in principle identical with the Wisconsin law. The freight rates are identical with those of the Potter law for classes A and B, in Missouri the lower classes of roads having no advantage except in passenger rates. The classification, too, is decidedly an original one; all through or trunk line roads being put in Class A, whether they earn less than their working expenses or 20 per cent. on their capital; all branches of trunk lines being put in Class B, while other branch roads form the lowest class, though they seem to have exactly the same limitations as those in Class B.

There is in Missouri just one railroad that pays dividends, and about half of the mileage in the State is in default on the interest on its bonded debt, and most of these defaults have been made within a year, and several very recently. The aids to bankruptcy which the Legislature has provided were not needed, one might think.

It is not probable that such a law as this can be maintained in Missouri. It is the peculiar provision concerning charters in the Wisconsin constitution that has enabled the Government to enforce the law so far in that State, and we never heard that there was any question in Missouri as to the binding nature of the contracts contained in the charters.

A HEAVY TRAFFIC passed over the Erie Railway's new bridge at Port Jervis, immediately after its completion. Freight trains had been held back in anticipation of the completion of the bridge till the road was full of them for miles. Within five minutes from the time when Mr. Chanute, the Engineer, pronounced the test of the bridge satisfactory, trains began to cross, and within twelve hours, besides all the regular passenger trains, 2,384 freight cars were hauled over the bridge.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

Detroit & Milwaukee.—At the annual meeting in Detroit March 23, the following directors were elected for the ensuing year: C. C. Trowbridge, C. J. Brydges, H. N. Walker, E. A. Brush, C. H. Buhl, Sir Hugh Allen, W. McMaster, Samuel Barber, Andrew Watson. The board subsequently elected C. C. Trowbridge, President, and C. J. Brydges, Vice-President.

St. Louis & Southeastern.—Mr. A. G. Thompson has been appointed Purchasing Agent and Traveling Auditor.

Pennsylvania Company.—Mr. C. P. Mackie has been appointed Secretary, and Mr. John C. Conn, Assistant Secretary. The office of the Secretary will be with the President, in Pennsylvania Railroad Company's building, No. 233 South Fourth street, Philadelphia; that of the Assistant Secretary in Pittsburgh.

Middleburg & Schoharie.—The following officers have been chosen for the ensuing year: President, Daniel D. Dodge; Vice-President, Lyman Sanford; Treasurer, Peter S. Danforth; Secretary, Jacob Neville.

Boston Society of Civil Engineers.—At the annual meeting in Boston, March 24, the old officers were re-elected as follows: President, Thomas Doane; Vice-President, Desmond Fitzgerald; Secretary, George S. Rice; Treasurer, Clemens Herschel; Librarian, E. K. Clark; Auditor, Joseph P. Davis.

Whitewater Valley.—Mr. G. L. Barringer, Superintendent of the Indianapolis, Cincinnati & Lafayette, will assume charge of this road also as Superintendent April 1.

Farmers' Union.—The officers of this company are: President, J. W. Tripp, Liscomb, Ia.; Vice-President, Wm. Battin, Liscomb, Ia.; Secretary and Treasurer, S. A. Emery, Liscomb, Ia.; General Agent and Superintendent, F. A. Soule, Chicago; Directors: J. C. Early, C. Whittaker, S. A. Emery, J. W. Tripp, J. Battin, T. Kennedy, M. Townsend, E. H. Watson, F. A. Soule.

Chicago & Paducah.—The Circuit Court has appointed Charles Voris, of Windsor, Ill., and M. W. Van Valkenburg, of Greenville, Ill., Receivers. Their appointment, however, was subsequently revoked and they were discharged.

Pennsylvania.—At the annual meeting in Philadelphia, March 23, the following directors were chosen, being the same board as last year: Josiah Bacon, Alexander Biddle, Alexander J. Derbyshire, Samuel M. Felton, John M. Kennedy, Wistar Morris, Henry M. Phillips, Thomas A. Scott, N. Parker Shortridge, Philadelphia; John Scott, Pittsburgh. The board re-elected, Thomas A. Scott, President; George B. Roberts, First Vice-President; Edward Smith, Second Vice-President; A. J. Cassatt, Third Vice-President; Bayard Butler, Treasurer; Joseph Lesley, Secretary.

San Bernardino.—The directors of this newly-organized company are: F. R. Brunn, W. A. Conn, J. W. Satterthwaite, James Stewart, W. S. Tittle. The company's office is at San Bernardino, Cal.

New Jersey & New York.—Mr. C. J. Clifford, late of the New Jersey Midland, has been appointed Master Mechanic.

San Francisco, San Mateo & Santa Cruz.—This company was organized at San Mateo, Cal., recently, by the election of the following directors: Josiah P. Ames, James W. Bicknell, Jas. Byrnes, John Garretson, Walter E. Sell, John Spaulding, Isaac C. Steele. The board elected James W. Bicknell, President; Isaac C. Steele, Vice-President; Walter E. Sell, Treasurer.

Louisville, Paducah & Southwestern.—The board has elected John G. Baxter, James Bradley and H. S. Moss directors in place of A. P. Cochran, Charles R. Long and John T. Moore, resigned.

Maine Central.—At the annual meeting in Waterville, Me., March 24, the number of directors was fixed at 13 and the following were chosen: Abner Coburn, Skowhegan, Me.; Noah Woods, Bangor, Me.; F. W. Hill, Exeter, Me.; Darius Allen, Augusta, Me.; N. M. Whitmore, Gardiner, Me.; Arthur Sewall, Bath, Me.; W. G. Davis, Portland, Me.; Frank Jones, Portsmouth, N. H.; James W. Johnson, Enfield, N. H.; James P. Cook, Salem, Mass.; John Wooldredge, Lynn, Mass.; John Cummings, Woburn, Mass.; Geo. L. Ward, Boston. The new directors are Messrs. Hill, Whitmore, Johnson and Cummings, who replace A. P. Morrill, J. P. Brown, Lewis Pierce, Lysander Strickland, Geo. M. Patten and T. K. Lothrop, the changes being all in the interest of the Eastern Railroad Company. The board elected Abner Coburn President; John Wooldredge, Vice-President; J. H. Drummond, Clerk. Mr. Coburn replaces Hon. Anson P. Morrill.

Passenger Conductors' Life Insurance Company.—At the annual meeting in Philadelphia, March 24, the following officers were chosen: President, W. S. Sears, Lake Shore & Michigan Southern; Vice-Presidents, A. Allen, Delaware, Lackawanna & Western; Wm. West, Marietta & Cincinnati, and Frank Lucas, Baltimore & Ohio; Secretary and Treasurer, Walter Lackey, Philadelphia, Wilmington & Baltimore; directors, J. P. Dukehart, Baltimore & Ohio; George F. Lincoln, Boston & Providence; A. F. Rightmeyer, Wilmington & Reading; J. M. Garrison, Erie; W. H. Lummis, Philadelphia, Wilmington & Baltimore; W. R. Kenney, Philadelphia & Reading; Samuel Fennimore, Amboy Division, Pennsylvania; James Stoever, North Pennsylvania; David Gill, West Chester & Philadelphia.

American Society of Civil Engineers.—At the meeting, March 3, the following were declared elected members: Amory Coffin, Phœnixville, Pa.; George Edward Harding, New York; Charles W. Howell, New Orleans, La.; Jacob H. Linville, Philadelphia. The following were declared elected juniors: Wendell R. Curtis, Hartford, Conn.; Frederick B. Howard, Waverly, N. Y.; Lorenzo M. Johnson, Keokuk, Iowa; Thomas Lafon, Newark, N. J.; P. Porter Poinier, Hoboken, N. J.

Burlington & Missouri River.—At the annual meeting in Burlington, Ia., March 23, the following directors were chosen: John W. Brooks, John M. Forbes, John A. Burnham, N. Thayer, Alpheus Hardy, B. S. Watson, H. H. Hunnewell, Boston; James F. Joy, Detroit; C. E. Perkins, Burlington, Ia.

Geneva, Ithaca & Athens.—Mr. Howard Elmer, of Waverly, N. Y., has been appointed Receiver.

Missouri & Western.—The first board of directors of this new company is as follows: Joseph Seligman, Josiah Macy, Jesse Seligman, Francis L. Macy, Jr., and Edward Livingston, all of New York. Mr. Joseph Seligman is President, and Edward Livingston Secretary and Treasurer.

Kentucky & Great Eastern.—At a meeting held in Cincinnati, March 29, the following directors were chosen: George Bliss, W. A. Booth, New York; M. E. Ingalls, Alfred Gaither, Stanley Matthews, S. J. Broadwell, Eli Kenney, R. S. Coleman, John Byrne, Cincinnati; John M. Duke, T. L. Jones, Kentucky.

Boston & Mystic Valley.—The provisional board of directors is as follows: S. A. Carlton, George Jacques, G. W. Sawyer, S. D. Swain, Somerville, Mass.; Stephen Dow, E. W. Hudson, Griffin Place, Granville Parks, Woburn, Mass.; C. M. Barrett, B. S. Wright, West Medford, Mass.; D. N. Skillings, S. W. Twombly, Winchester, Mass.; Henry Blanchard, Wilmington, Mass.

Vicksburg, Shreveport & Texas.—The United States Circuit Court has appointed John W. Greene Receiver.

PERSONAL.

—A grand banquet was given to Capt. James B. Eads, on his return from Washington, at the Southern Hotel, St. Louis, by the citizens of that place, on the evening of the 23d of March, at which more than two hundred leading citizens were present. A model of the jetties which Captain Eads is to construct at the mouth of the Mississippi was presented to him by the ladies of St. Louis, and another ornament was a model of Captain Eads' St. Louis Bridge, five feet long, made of cut flowers. A very flattering address of welcome was made to the eminent engineer by Mayor Brown. In his reply to this, referring to the improvement of the mouth of the Mississippi, Captain Eads said:

"If the profession of an engineer were not based upon exact science I might tremble for the result in view of the immensity of the interests which are dependent upon my success. But every atom that moves onward in the river, from the moment it leaves its home amid the crystal springs or mountain snows throughout the 1,500 leagues of its devious pathway, until it is finally lost in the vast waters of the gulf, is controlled by laws as fixed and certain as those which direct the majestic march of the heavenly spheres. Every phenomenon and apparent eccentricity of the river, its scouring and depositing action, its curving banks, the formation of the bars at its mouth, the effect of the waves and tides of the sea upon its currents and deposits, are controlled by laws as immutable as the Creator, and the engineer needs only to be assured that he does not ignore the existence of any of these laws, to feel positively certain of the result he aims at.

"I therefore undertake the work with a faith based upon the ever-constant ordinances of God Himself; and so certain as He will spare my life and faculties for two years more I will give to the Mississippi River, through His grace and by the application of His laws, a deep, open, safe and permanent outlet to the sea."

Speeches were made also by Congressman Erastus Wells, Gen. W. T. Sherman, and others, the report of the banquet filling about twelve columns of the St. Louis *Republican*.

TRAFFIC AND EARNINGS.

Cotton Movement.

The receipts at all points are reported as follows:

	1875.	1874.	Decrease.	P. c.
Week ending March 26	47,433	64,587	17,154	26.6
Sept. 1 to March 26	3,151,447	3,361,238	209,791	6.2
The exports were:				
Week ending March 26	57,515	86,936	29,421	33.9
Sept. 1 to March 26	2,045,430	2,117,802	72,363	3.4

The receipts have increased this crop year 12½ per cent. at Mobile, 6¼ per cent. at Charleston, 114 per cent. at North Carolina ports, and 47½ per cent. at the small ports not named. At all other ports there has been a decrease, amounting to 16 per cent. at New Orleans.

Chicago Traffic.

Receipts for the week ending March 27 were 66,920 barrels of flour and 793,530 bushels of grain of all kinds this year, against 53,185 barrels of flour and 865,977 bushels of grain in 1874. There is an increase of more than a quarter in wheat receipts and a decrease in all other grains except barley. Heretofore this year wheat has been slowest of all the crops to come forward. The shipments from Chicago for the week were 40,204 barrels of flour and 500,674 bushels of grain in 1875, against 44,560 barrels of flour and 619,898 bushels of grain in 1874. More than half the grain this year was wheat, and the shipments of it were nearly a quarter greater than last year. Hog and cattle receipts were considerably greater this year than last.

Railroad Earnings.

The following companies have reported earnings:

Year 1874:	1874.	1873.	Inc. or Dec.	P. c.
Cleveland, Mt. Vernon & Delaware	$445,800	$355,325	Inc.. $90,475	25½
Expenses	309,846	222,158	Inc.. 87,688	39½
Net earnings	$135,954	$133,167	Inc.. 12,787	2¾
Earnings per mile	$2,839	$2,798	Inc.. $41	1½
Per cent. of expenses	69.50	62.52	....	....
Columbus & Hocking Valley	$717,491	$1,074,187	Dec.. $356,696	33¼
Expenses	360,413	698,028	Dec.. 337,615	48⅜
Net earnings	$357,078	$376,159	Dec.. $19 081	5⅛
Earnings per mile	$8,062	$12,070	Dec.. $4,008	33¼
Per cent. of expenses	50.20	64.98	....	....
Maine Central	$2,094,080	$2,065,360	Inc.. $28,720	1⅜
Expenses	1,281,681	1,330,501	Dec.. 48,820	3⅝
Net earnings	$812,399	$734,859	Inc.. $77,540	10½
Earnings per mile	$5,899	$5,818	Inc.. $81	1⅜
Per cent. of expenses	61.20	61.42	....	....
Lk. Sh. & Mich. Soth'n:	1875.	1874.		
Jan. 1 to March 14	$2,455,990	$3,432,852	Dec.. $976,062	28½
Union Pacific:				
March 1 to March 26	676,965	519,812	Inc.. 157,153	30¼
Great Western:				
Week ending Mar. 5	£15,560	£21,037	Dec.. £5,477	26½
Grand Trunk:				
Week ending Mar. 6	38,400	28,400	Inc.. 10,000	35¼
St. Lo., Iron M't'n & So.:				
Second week in Mar	$65,702	$61,682	Inc.. $4,020	6½
Denver & Rio Grande:				
Third week in March	5,704	5,442	Inc.. 262	5

The last named road shipped no coal during the week on account of a miners' strike.

Flour and Grain Movement.

Receipts and shipments for the week ending March 20 and the calendar and crop years down to that date are reported as follows:

Flour—	1875.	1874.	Inc. or Dec.	P. c.
March 14 to March 20:				
Lake ports' receipts	75,351	125,730	Dec.. 50.379	40.0
" " shipments	85,814	101,558	" .. 15,744	15.5
Atlantic ports' receipts	165,433	187,999	" .. 22,566	12.0
Jan. 1 to March 20:				
Lake ports' receipts	854,939	1,440,686	" .. 585,747	40.7
" " shipments	859,002	1,284,430	" .. 425,428	33.1
Atlantic ports' receipts	1,647,305	2,479,911	" .. 832,606	33 4
Aug. 1 to Jan. 20:				
Lake ports' receipts	3,408,919	4,109,844	" .. 700,925	17.0
Wheat—				
Week ending March 20:				
Lake ports' receipts	762,776	754,819	Inc.. 7.957	1.1
" " shipments	449,195	508,960	Dec.. 59 765	11.7
Atlantic ports' receipts	401,244	414,110	" .. 12,866	3.1
Jan. 1 to March 20:				
Lake ports' receipts	8,199,128	16,308,484	" ..8 109,356	49.7
" " shipments	2,745 403	7,457,562	" ..4,712,159	63.2
Atlantic ports' receipts	3 365,174	9,267,125	" . 5,901,951	63.7
Aug. 1 to March 20:				
Lake ports' receipts	42,729,864	57,643,459	" .14,913,595	25.9
July 1 to March 19:				
San Francisco exports	10,612,875	9,029,769	Inc ..1.583,106	17.5
Grain of all kinds—				
Week ending March 30:	1875.	1874.	Inc. or Dec.	P.c.
Lake ports' receipts	1,881.185	1,928 348	Dec. 47,163	2.4
Lake ports' shipments	1,118,840	985,056	Inc. 133,784	13.5
Atlantic ports' receipts	1,618,858	1,530,557	Inc. 88,301	5 8
Jan 1. to March 20:				
Lake ports' receipts	22,537,489	30,027,701	Dec. 7,490,212	24.9
Lake ports' shipments	9,402,098	12,696,197	Dec. 3,294,099	26.0
Atlantic ports' receipts	19,354,012	21,383,773	Dec. 2,029,761	9.5
August 1 to March 20:				
Lake ports' receipts	92,325,451	116,117.140	Dec.23,791.689	20.5

Notwithstanding the great decrease in receipts and shipments for the crop and calendar years, compared with 1874, there is not a great decrease of receipts compared with previous years (6.6 per cent. for the crop year compared with 1872–73, and less than 3 per cent. compared with 1871–2); and the shipments from lake ports for the calendar year, though 2.6 per cent. less than last year, were yet 20 per cent. greater than in 1873 or 1872. The unfavorable comparisons are largely due to the exceptionally heavy traffic of 1874.

The progress of shipments from lake ports under the low rates ruling is shown by the following:

Week ending:	Feb. 27.	March 6.	March 13.	M'h 20.
Flour, bbls	63,071	50 734	93,749	85.514
Grain, bush	495,562	474,689	825.527	1.118,840

There was about 7,000,000 bushels of grain in store at Chicago on the 20th and 2,170,000 at Milwaukee, and at present rates this stock ought to be greatly depleted before navigation opens.

Russian wheat exports from the sea of Azof were 13,650,000 bushels in 1874.

Petroleum Movement.

From Jan. 1 to March 20 the exports have been:

From	1875. Gallons.	1874. Gallons.	1873. Gallons.	1872. Gallons.
New York	22 342,846	27,944,883	17,608,207	12,092.046
Boston	477.735	683,838	522,060	341.012
Philadelphia	5,206.206	12,248,904	7,292.108	7,345.564
Baltimore	3.635,449	508,992	266,222	102,793
Total gallons	31,662,236	41,386,667	25,688,597	19,881,415

There are probably no other exports except to Canada.

Receipts of crude at Pittsburgh were 87,324 barrels in 1875 against 374,168 in 1874, 300,434 in 1873, and 210,363 in 1872.

Coal Movement.

Week ending March 20:

	1875.	1874.	Inc. or dec.	P. c.
Anthracite	170.477	326,105	Dec. 155,628	47¾
Cumberland	28,990	.....	.....	..
Semi-bituminous, Broad Top and Clearfield	26.407	.....	.....	..
Bituminous, Pittsburgh	12.383	.....	.....	..
Bituminous, West Virginia	3,325	.....	.....	..

Cleveland coal receipts during 1874 were:

	Tons.
Cleveland, Col., Cin. & Indianapolis road	102,201
Cleveland & Pittsburgh	599,908
Atlantic & Great Western, bituminous	487,130
" " " anthracite	23,179
Ohio Canal	142,820
Total	1,295,238

THE SCRAP HEAP.

Railroad Manufactures.

It is stated that the Taunton (Mass.) Car Works have been sold to Oliver Ames, S. L. Crocker and William Mason for $16,000.

The Vallejo Foundry, at Vallejo, Cal., is making the iron

work for 50 box cars for the North Pacific Coast road. The cars will be built in the company's shop.

The Philadelphia & Reading Railroad Company's rolling mill at Reading, Pa., resumed work March 29, after a stoppage of three months.

The Warren Spike Works at Warren, O., has recently been removed to that place from Niles, O. The shop has a capacity of 15 tons of spikes per day.

The Pennsylvania Steel Company at Harrisburg, Pa., intends to erect two additional furnaces during the coming summer. The company recently declared a semi-annual dividend of 4 per cent.

The Mason Machine Works at Taunton, Mass., have just completed a double-truck narrow-gauge engine with 15 by 20 inch cylinders for the North Pacific Coast road.

The Ohio Falls Car Company, at Jeffersonville, Ind., recently delivered 25 stock cars to the Terre Haute & Indianapolis road.

An order embracing 358 tons of bridge bolts for the Howe truss bridges for the North Shore Railroad, of Canada, was recently received by S. D. Kimbark, Chicago.

Silicon Steel Rails.

The St. Albans (Vt.) *Messenger* says: "Since publishing the statistics of the failure of the silicon rails made at Sandusky, we have received from Superintendent Gustin the following statistics of the silicon-steel-top rails manufactured by the St. Albans Iron and Steel Works:

NAME OF ROAD.	No. of rails laid.	Rec'd of service.	No. rails failed.	Pr.ct. of failure.
Central Vt., Laid 1873	1,442	14 m'ths.	*44	1.22
" " " 1874	2,074	7 "		
Chesh're	706	6 "	none.	
Passumpsic River	566	6 "	none.	
Northern (N. H.)	408	4 "	2	0.49
Concord	408	4 "	none.	
O'd Colony	408	4 "	none.	
Conn. River	214	11 "	5	2.33
Vermont & Mass.	35	12 "	not heard from.	
Boston & Providence	35	12 "	none.	

* Twenty of the forty-four repaired and now in track; Bessemer steel cannot be repaired.

SUMMARY OF THE ABOVE.

Total No. of rails laid.	Total average service.	Total No. of rails failed.	Total av. per ct. of failure.
6,296	8 months.	51	0.81

"About 80 per cent. of the failures occurred in the first three hundred tons that were made, and were faults in manufacture consequent upon the starting of a new mill and teaching workmen a new mode of manufacture, unsound ends caused by not cutting off enough at the saw, etc., etc.

"The Superintendent of the Cheshire road says: 'The rails are wearing well, none having failed.' The Superintendent of the Passumpsic says: 'The appearance of them thus far is as perfect as when laid. Our Road Master has entire faith in them.'

"The Superintendent of the Northern says: 'Those rails have been laid on a heavy grade; two have failed so far that they must be mended.' The Superintendent of the Connecticut River says: 'Nothing good or bad to say about the rails; looking as well as our Bessemer steel.'

"Mr. Gustin adds that rails which will stand up under the heavy traffic on the different roads as these have done, with such a trifling failure, are sure to have a long life."

British Rail Exports.

For the month of February and the two months ending with February the exports of railroad iron of all kinds were (in tons):

February:	1875.	1874.	Decrease.	P. c.
To all countries	35,086	49,713	14,627	29.4
To United States	....	4,573	4,573	100
January and February:				
To all countries	71,257	96,311	25,054	26.0
To United States	....	8,894	8,894	100

The largest customer for the two months has been Australia, which took nearly 13 per cent. of the total exports, the second being Italy, with about 12¾ per cent.; third, Peru, with 12¼ per cent.; fourth, British India, with 10¼ per cent. Three-eighths of the total exports were to America, though none were to the United States, and our ironmasters will probably some day compete for the whole of this trade.

Boston Society of Civil Engineers.

The annual meeting was held at the rooms of the Society, No. 66 State street, Boston, March 24. The board of government submitted its annual report and the old officers were re-elected for another year. Mr. Charles H. Parker then read an interesting paper on "Facts and Experiences on Heated Air as a Motive Power." The meeting was largely attended, and the interest kept up to a late hour.

"Hoop-er-Up."

The Adrian (Mich.) *Times* says: "One of the most popular freight conductors on the Detroit division of the Lake Shore & Michigan Southern has an impediment in his speech. A short time ago, after making an unusually long stop at Wyandotte, he told the engineer to go ahead and 'hoop-er-up.' This last hint was overheard by the Superintendent, who made a mental note of it. According to the popular understanding of the term, hoop-er up is something which is expressly forbidden to freight trains on this well-conducted road, and a few days after, the conductor and Superintendent met, and thus the latter: '——, the other day when starting out of Wyandotte I heard you tell the engineer to 'hoop-er-up.' What did you mean by that?' The conductor hesitated for a second, and then his vocal impediment came into good play. 'I-I-I-m-m-meant,' said he, 'p-p-proceed with-h-h c-c-caution.' The explanation was satisfactory, but some of the railroad boys thought they had a new definition for 'hoop-er-up.'"

The Albany & Rensselaer Iron & Steel Company.

This company has executed and put on record a mortgage covering all its property and given to the United States Trust Company of New York as trustee. It is given to secure an issue of $1,500,000 of bonds to be made hereafter.

OLD AND NEW ROADS.

Pacific Traffic.

A further adjustment of rates has been made by representatives of the Pacific Railroads and the Pacific Mail Steamship Company on through California business. Under the new arrangement the railroad companies will discontinue the sale of the "continuous trip" tickets limited to fifteen days between New York and San Francisco, and formerly sold for $125. The only through first-class ticket sold will be $138.40: good as a stop-over ticket, for a year. The second-class tickets will be $105, and the third-class, or emigrant ticket, $65. Steamer rates will be the same.

To compensate the Pacific Mail for loss of third-class passenger traffic, the roads east of Omaha will pay to the Union Pacific Railroad, for the benefit of the Pacific Mail Company, five dollars on each passenger of that class carried by them.

The new freight tariff shows an increase over that recently adopted, the rates per 100 pounds being as follows from New York to San Francisco, Sacramento, Marysville and San Jose:

	1st Class.	2d Class.	3d Class.	4th Class.	Class A.	Class B.	Class C.	Class D.
By railroad	$6 00	$5 00	$4 00	$3 00	$2 50	$2 00	$1 75	$1 50
By steam	4 50	3 50	2 50	2 25	2 00	1 75	1 50	1 30

The new rates took effect April 1, and apply to all leading Eastern points as well as to New York.

Louisville, Paducah & Southwestern.

At a special meeting of the stockholders in Louisville, Ky., March 24, the directors submitted a report on the condition of the company and tendered their resignations in a body. After some discussion it was resolved not to accept them on account of some doubt as to the legality of the proceeding. The desired changes were afterwards effected by individual resignations and the filling of the vacancies by the board with gentlemen who represent specially the Louisville city stock.

A committee consisting of the President of the company, the Mayor of Louisville, L. M. Flournoy, R. R. Radcliffe and W. L. Conklin was appointed to negotiate a lease of the road subject to the approval of the stockholders. The meeting then adjourned for a day, pending the action of the City Council on the proposed loan to the company.

The liabilities of the company are as follows:

Capital stock	$3,893,800
Stock subscriptions	297,550
Main line bonds	3,000,000
Louisville Branch bonds	776,000
Floating debt	864,963
Total	$8,839,313

There are also right of way claims and unpaid taxes amounting to about $75,000. Of the floating debt $194,445 is for past due coupons. Two coupons have been passed, and the bondholders are arranging to begin foreclosure proceedings, the commencement of the suit being daily looked for. The road has suffered and has lost much business from the lack of suitable and sufficient equipment to carry it, and much expense has resulted from litigation caused by inability to pay debts.

The Louisville Board of Aldermen indefinitely postponed the ordinance, thus practically killing it. At the stockholders' adjourned meeting no further action was taken, but an adjournment was had until May 5. In the mean time the committee will take immediate steps toward leasing the road.

Boston, Revere Beach & Lynn.

Work on this road was begun in East Boston, March 29. Just out of East Boston there is a tunnel 400 feet long, which has been let to Gardiner & Blaisdell. The bridge work has been let to T. P. Richardson, of New York, and is to be completed May 20. The ties, also, have been contracted for, and the rails are being made by the St. Albans Rolling Mills. They are to be 40 lbs to the yard. The engines are being built at the Mason Machine Works at Taunton, and the cars are also under contract. The expectation is that the road will be completed by July 1. It is to be of 3 feet gauge and will be single track except at Revere Beach, where a double track will be laid along the whole stretch of the beach. Much of the right of way has been given by the owners of the land.

Chicago & Lake Huron.

Work is in progress on the connecting link between the two divisions, the 46 miles from Lansing to Flint, Mich. The ties have been gotten out during the winter, and gangs have been employed on the deep cuts. The right of way for the whole line has been secured. The working force will be increased as soon as the weather permits.

Cincinnati, Hamilton & Dayton.

A number of the stockholders met in Cincinnati, March 25, to hear the report of a committee appointed in May last to examine into the affairs of the road. The movement was originally caused by dissatisfaction at the passing of dividends. The report now presented expresses confidence in the value of the property, and a belief that the affairs of the company are in better hands than for some time past. Some fault is found with the purchase of the Junction Railroad, but the hope is expressed that that road with careful management will eventually be a good property.

After some discussion the report was accepted and a committee appointed to nominate a board of directors to be voted for at the annual meeting in June.

Philadelphia & Reading.

The striking miners in the Schuylkill region have begun to use violence against the property of the railroad company, and in one or two cases depot buildings and cars have been burned.

The employes in the shops at Cressona and Schuylkill Haven and the trainmen on the lateral roads have resumed work and accepted the company's terms, severing their connection with the Mechanics' and Workingmen's Benevolent Association.

Dividends.

Dividends have been declared by the following companies:

New York, Providence & Boston, 2½ per cent., quarterly, payable April 10.

United New Jersey, 2½ per cent., quarterly, payable April 10.

Delaware, Lackawanna & Western, 2½ per cent., quarterly, payable April 20.

East Tennessee, Virginia & Georgia, 3 per cent., semi-annual, payable April 1.

Central of New Jersey, 2½ per cent., quarterly, payable April 20.

Philadelphia & Trenton, 2¼ per cent., quarterly, payable April 10.

Pacific of Missouri, 1¼ per cent., quarterly, payable by Atlantic & Pacific Company, lessees, April 20.

Berkshire (leased by Housatonic), 1¾ per cent., quarterly, payable April 12.

Ogdensburg & Lake Champlain, 4 per cent., semi-annual, on the preferred stock, payable April 1.

Vermont & Massachusetts (Fitchburg Company, lessee), 2 per cent., semi-annual, payable April 5.

Monticello & Port Jervis.

The first-mortgage bondholders met in New York, March 30, and appointed Henry Day, Adam Norrie and S. A. De Peyster a committee with authority to bid in the road at the foreclosure sale and organize a new company. Those present signed the agreement and authority was given the committee to obtain the signatures of others.

The Railroad War.

The reduction of freight rates, which was begun by the Baltimore & Ohio, is apparently to extend to all the trunk lines. At a meeting held in Chicago, March 25, the general freight agents of the Lake Shore & Michigan Southern, the Michigan Central and the Pennsylvania Company resolved to adopt the following rates per 100 pounds on fourth class and grain: to Boston and New England points, 40 cents; New York, 30 cents; Philadelphia and Baltimore, 25 cents.

The passenger agents of the same companies have agreed on a general reduction of through fares. From Chicago to Baltimore and Washington the fare is cut down from $19 to $9; to Philadelphia, from $19 to $12; to New York, from $22 to $15; from Boston, from $27 to $18.85. Tickets at the reduced rates are good only for 48 hours after sale.

Baltimore & Ohio.

With the opening of spring considerable improvements are being made in the freight yard at Locust Point, Baltimore. The foundations of a sugar warehouse 320 by 150 feet have been completed, and a coffee warehouse of about the same dimensions is also to be built. A new round house to hold 44 engines is well under way. It is intended to run the freight trains through to Locust Point shortly, instead of stopping them at Mount Clare and distributing the cars from that point as is now done.

Erie.

There is a report that the company's coal lands in Pennsylvania have been sold to an English company, $3,000,000 being named as the price.

The temporary bridge over the Delaware at Saw Mill Rift was completed so that trains could pass over it on the afternoon of March 27. Through trains began to run again the same evening. Trains began running over it five minutes after it was tested, and there were very short intervals between them for the next 24 hours.

A reduction, averaging nearly 25 per cent., has been made in the prices of commutation for one and three months from New York to stations between Jersey City and Sufferns. A slight reduction is made in the six months; but none in the yearly rates. The object is to encourage local and summer travel.

Boston & Mystic Valley.

A provisional organization has been made by a company of this name to build a railroad from Boston by way of Somerville, West Medford, Winchester and Woburn to Wilmington, about 15 miles. It is intended mainly for suburban traffic and will come directly in competition with the Boston & Lowell road. It is, indeed, mainly supported by parties who are dissatisfied with the present management of that road.

Philadelphia, Wilmington & Baltimore.

A second track is to be built this season from Aberdeen to Chase's, 13 miles, which will complete the second track from Baltimore to Chester. From Chester to Philadelphia there are already three tracks.

The Missouri Railroad Law.

The Missouri Legislature has passed a bill which provides for an arbitrary limit of rates to be charged for passenger fares and for large classes of freight and generally for the regulation of the railroads of the State by a board of three commissioners. It divides the railroads of the State into three classes: Class A, including all through or trunk line roads; class B, all branch roads owned or leased by a through line; class C, all others. The maximum passenger rate is to be 3 cents per mile for class A, and 4 cents for classes B and C.

All freights are divided into four general classes, to be designated as first, second, third and fourth classes, and into seven special classes, to be designated as class D, E, F, G, H, I and J; class D shall comprise all grain in car-loads; class E shall comprise flour in lots of 50 barrels or more, and lime in lots of 24 barrels or more; class F shall comprise salt in lots of 60 barrels or more, and cement, water lime and stucco, in lots of 24 barrels or more; class G shall comprise lumber, lath and shingles in car-loads; class H shall comprise live stock in car-loads; class I shall comprise agricultural implements, furniture and wagons; class J shall comprise coal, brick, sand, stone, railroad ties and cord wood, and all heavy fourth-class articles in car-loads; and in addition to the several articles in the said special classes, shall be added other articles as in the manner prescribed, except into classes D, E, G and H, and all articles not before enumerated or subsequently set into said classes as provided, shall be placed in and belong to the four general classes, to be classified by the railroad commissioners.

The maximum rates provided for all classes of roads for the seven special classes are as follows:

	First 25 miles.	Second 25 miles.	Each additional 25 miles up to 200 miles.	Each additional 25 miles over 200 miles.
Class D, per 100 lbs	6 cents.	4 cents.	2 cents.	0½ cent.
Class E, per barrel	12 "	8 "	4 "	1 "
Class F, per barrel	15 "	6 "	3½ "	....
Class G, per car-load	$8	$5	$2	....
Class H, per car-load	10	7	4	....
Class I, per car-load	11	6	3	....
Class J, per car-load	8	6	2 50	....

In all cases where there is a fraction less than 13, after dividing by 25, only half the 25-mile rate is allowed for that distance. In computing the rates of freight according to the provisions of this act, the distance shall be computed from the point where it is received in this State, notwithstanding it may pass from one road to another.

The Railroad Commissioners are to have power to fix all rates and reduce maximum rates and to classify freight and place articles in any of the general or special classes except the special classes D, E, G and H. They are also to attend to the enforcement of the law.

The bill is now in the hands of the Governor, who, it is thought will probably sign it, though he has expressed objections to some of its provisions.

Auction Sales of Railroad Securities.

The following prices were obtained at sales made in New York, March 31: Oswego & Syracuse stock, 108½; Indianapolis & St. Louis first mortgage bonds, 77; Terre Haute & Indianapolis first-mortgage bonds, 104¾; Central, of Iowa, first-mortgage bonds, 35; Indianapolis, Bloomington & Western first-mortgage bonds, 35; Cairo & Fulton, first-mortgage bonds, 55¼; Atlantic & Pacific land mortgage, 40; Houston & Great Northern first-mortgage, 58; Chicago & Canada Southern first-mortgage 21½; Kansas Pacific stock, 13⅞ and 14.

Missouri Railroad Taxation.

The new law passed by the Missouri Legislature for the taxation of railroads is summed up as follows by the St. Louis *Republican*: "The law directs that the President or other chief officer of every railroad in this State shall, on or before January 1, every year, make a sworn statement to the State Auditor, of the length of his road, including branches and leased lines, in each county, township and city through which it runs; the total number of engines and cars of all kinds; and the machinery, shops and all other property owned by it. A duplicate of this statement is to be sent to the clerk of the court of every county through which the road runs, or in which any of its property may be located. These duplicate statements are to be submitted to the county courts for examination, and, if found correct, are to be certified as correct to the State Auditor; if found to

be incorrect, the court is to certify what items of property are omitted, and these are to be taxed at double value. These duplicate returns are to be certified to the State Auditor on or before April 1, and the State Board of Equalization, in the following May, is to assess the taxes and apportion them to the State, the counties, the townships and the cities and towns, and the taxes are to be paid according to this apportionment, on or before July following, under a penalty of 2½ per cent. a month on the amount levied. After July 10 collectors may seize and sell the railroad property for non-payment of taxes."

Vicksburg, Shreveport & Texas.

In accordance with the decision of the United States Supreme Court in the case of Jackson and others against Ludeling, the North Louisiana & Texas Company and others, and with the mandate of that court, the United States Circuit Court for Louisiana has made a formal decree setting aside the sale of this road to Ludeling and others and enjoining the defendants from claiming any further rights in the premises. Mr. John W. Greene is appointed Receiver to take charge of the property. An inventory is to be made of all the property and the defendants are required to account for everything which passed into their hands under the fraudulent sale which is now set aside.

The road will be sold under the direction of the Court for the benefit of the bondholders and other creditors of the Vicksburg, Shreveport & Texas Company, and F. A. Woolfley, is appointed a special master to take proofs of bonds and other claims.

Northern Central.

At a meeting of the directors held in Baltimore, March 27, the new contract with the Canton Company for the use of the Union Railroad was approved. The contract is, in short, as follows:

Rebates are to be made by the Canton Company on coal, coal oil and lumber of 10 cents per ton from the contract rates of the Union Railroad with the other railroad companies, the quantity of freight guaranteed by the Northern Central Railroad and Potomac Railroads to be not less than 550,000 tons per annum, within five years, and 1,000,000 tons for two consecutive years, within ten years, otherwise the terms of the original contract are to remain in full force. It was further agreed that the improvements contemplated by the Northern Central and Baltimore & Potomac railroads at Canton shall be commenced at once and completed as soon as possible. The improvements to consist of coal wharves and piers, a grain elevator of 500,000 bushels capacity, and warehouses for coffee, sugar, etc., the whole estimated to cost $690,000.

The plans for the new office building in Baltimore were approved.

Maine Railroad Legislation.

The Legislature of Maine at its recent session passed acts providing for the summary seizure and sale of the property of a railroad company in case of its refusal to pay taxes assessed upon it. If the tax is deemed illegal the company can have its remedy by action against the State Treasurer.

Another law requires railroad companies to fence their roads where they pass through enclosed or improved land and imposes a fine of $100 for each case of neglect to do so, or to repair fences, after receiving due notice from the owner of the land.

Geneva, Ithaca & Athens.

This road has been put in the hands of a receiver, and Howard Elmer, of Waverly, N. Y., has been appointed to that position.

The road, which was formed about a year ago by the consolidation of the Geneva & Ithaca and the Ithaca & Athens, is 77 miles long, from Sayre, Pa., a little west of north to Geneva, N. Y. It recently passed under the control of parties interested in the Lehigh Valley and Cayuga roads.

Maryland & Delaware Ship Canal.

Work was actually begun on this canal upon Blackbird Creek, near Blackbird, Del., March 22. The contractor, Mr. Kenneday, has a small force at work, which will be increased as the weather grows more favorable. This is on the Sassafras River, or northern route.

Grand Trunk.

Some dissatisfaction is expressed by some of the first and second preference bondholders of this company that they did not get a full dividend last year, but only 2½ per cent., just one-half what they were entitled to get; and a Mr. John Lornie, who holds 8,000 shares, is forming a committee for ousting the directors, if they do not change their policy. He complains that £160,000 of earnings went to purchase new rails, instead of being distributed among the bondholders. That of course raises a question of capital; and as debenture stock is to be issued it is claimed that it should have been issued sooner, so that the first and second preference bondholders could have got their due. It is argued that from the policy pursued the debenture stock will probably not bring 90.

The Grand Trunk and Great Western Companies have ceased cutting rates, and have agreed upon a common schedule to competing points. This course has been taken in obedience to orders from England.

Southern Minnesota.

Notice is given that the coupons on the first-mortgage bonds of the issue of 1864, due April 1, will be paid on and after that date until April 15 at the Third National Bank, New York. There is some talk of extending the road westward from Winnebago this season.

Kentucky & Great Eastern.

This company has been reorganized, and at a meeting held in Cincinnati, March 29, contracts for the construction of the road from that city to Huntington, W. Va., were approved.

Chicago, Dubuque & Minnesota.

It is stated that this company will this season run its trains only to Brownsville, Minn., seven miles south of La Crescent, the present terminus, and will run a transfer ferry from that point to La Crosse.

Kansas Railroad Law.

A law passed by the Kansas Legislature at its last session compels companies incorporated in the State to have their general offices within its limits. This law affects the Kansas Pacific, the Missouri River, Fort Scott & Gulf, and the Leavenworth, Lawrence & Galveston companies, whose offices are at Kansas City, and the St. Joseph & Denver, whose office is at St. Joseph, Mo. The Kansas Pacific general offices have already been removed from Kansas City just across the State line to Armstrong, Kan.

East Tennessee, Virginia & Georgia.

The recent damages by flood to the Southern Division have been repaired, including the bridge over the Hiwassee River, and through trains are now running regularly.

New York, Kingston & Syracuse.

In 1872, the Rondout & Oswego Company issued $2,000,000 of first-mortgage bonds, which were sold. Subsequently the name of the road was changed to New York, Kingston & Syracuse, and a consolidated mortgage executed for $4,000,000, of which $2,000,000 were to be used to retire the original first-mortgage bonds. The contractor, Wm. B. Litchfield, purchased a lot of iron from Ernest Caylus & Co., and pledged with them $147,000 of the consolidated bonds as security. The contractor became bankrupt, and Caylus & Co. were unable to recover. They therefore brought suit in the New York Supreme Court against the directors personally, claiming that they were liable, having falsely represented the consolidated bonds as a first lien on the road, while they were really only a second lien. The court decided that the directors were not liable, as there had been no misrepresentation, and the mortgage deed showed that the first-mortgage bonds had not been, but were to be thereafter, retired.

Pittsburgh, Wheeling & Kentucky.

The representatives of Brooke and Ohio counties, W. Va., which own nearly all the stock, are now preparing as fast as possible to pay off the debts of the road. When this is done, it is expected that parties can be found who will take the road bed and iron it and furnish equipment.

Galveston, Harrisburg & San Antonio.

The grading is now finished for 15 miles west of Luling, Tex., and work is progressing slowly. It is expected that the road will be completed to the Guadalupe River by September 1.

Detroit, Hillsdale & Indiana.

The Lansing (Mich.) *Republican* says: "Samuel F. Cook, of the State Railroad Commissioner's office, informs us that the statement now going the rounds of the press, that no trains have been run on the Detroit, Hillsdale & Indiana Railroad since its sale under mortgage, is untrue, and that regular daily trains are running over the road."

Davenport & St. Paul.

It is stated that the appointment of Mr. John E. Henry as Receiver, in place of Mr. French, removes the road entirely from the management of the old Construction Company interest. It is understood that the attempt to extend the road into Davenport by way of East Davenport will be given up, and that the Receiver will endeavor to make an arrangement to use the Chicago, Rock Island & Pacific track into the city, as was formerly done. The suits against the city will be withdrawn. Arrangements will be made as soon as possible to pay off the employes, some of whom have nearly six months' pay due them.

California Narrow-Gauge.

The California Narrow-Gauge Railroad & Transportation Company has been organized for the purpose of building a railroad from Dumbarton Point, Alameda County, Cal., through Alviso, Santa Clara and San Jose to New Almaden, with a branch from Santa Clara to Congress Springs. The main line will be about 40 miles long and the capital stock will be $1,000 000. The company also intends to maintain a steamboat line from Dumbarton Point to San Francisco.

Hanover & York.

At a meeting of the board of directors in York, Pa., March 20, a lease of the road to the Pennsylvania Railroad Company was finally agreed upon. The Hanover & York Company agrees to have the road finished by July 1, when the lessee will take possession.

Vermont Central.

W. C. Smith, Estes Howe and Joseph H. Converse, trustees under the second mortgage, give notice that they will sell the Vermont Central Railroad at auction for cash at the Court House in Montpelier, Vt., June 22. The sale will be subject to the claims of the Vermont & Canada Company, to the first mortgage and to any other liens and claims existing thereon, growing out of the administration of said property under direction of the Court of Chancery of Vermont.

The sale is to be made in order to carry out the plan of consolidation of all the interests now under the management of the Central Vermont Company as trustee.

New York, New Haven & Hartford.

The Connecticut Railroad Commissioners, after considering and taking legal advice on the charges made by Mr. Goodwin against this company, have concluded not to pursue the investigation any further, more especially as it would require an examination into the affairs of the New York & New Haven and the Hartford & New Haven companies previous to the consolidation.

New London Northern.

The completed survey for the proposed branch to Springfield gives a line 22 miles long, with six miles of 66 feet grade to the mile, the other grades being moderate, though the line is not very direct. It leaves the main line at Stafford Springs, Conn. The engineer's estimate of the cost of constructing the road is $500,000.

St. Louis, Keosauqua & St. Paul.

The latest plan proposed to raise money for the construction of this road is to issue bonds at the rate of $10,000 per mile, bearing 8 per cent. interest, the coupons of which as they come due shall be receivable in payment for freights. Whenever the earnings shall exceed operating expenses and interest, then bondholders shall have the right to credit upon the principal of their bonds all freight money due to the road.

Louisiana & Missouri River.

In compliance with a decree made by the Pike County (Mo.) Circuit Court, in the suit of John Sheehan and others against this company, J. C. Gillaspy, Sheriff of Boone County, will sell at public auction in Columbia, Mo., April 22, the whole property of this company, including the franchises, the completed road from Louisiana to Mexico, and from Mexico to Jefferson City, the unfinished section, from Mexico to Kansas City, and all the buildings, equipment and other property.

Alabama & Chattanooga.

The repair shops are to be permanently located in Birmingham, Ala.

Buffalo & Jamestown.

The track is now laid to Cherry Creek, nine miles beyond the late terminus at Dayton, N. Y., and 45 miles southward from Buffalo. The City Engineer having reported the road completed thus far, the Buffalo City Council has ordered the issue of another installment of $75,000 city bonds to the company.

Buchanan & Clifton Forge.

The Virginia Legislature has passed the bill authorizing the James River & Kanawha Canal Company to subscribe to the stock of this proposed road, and the city of Richmond to guarantee such subscription.

Keokuk Northern Line Packet Company.

The long litigation as to the control of this company is over the Missouri Courts having decided that the sale of 1,520 shares of the stock by the old Keokuk Packet Company to Capt. W. F. Davidson was legal and valid. The injunction restraining the transfer of that stock has been dissolved.

Danville, Hazleton & Wilkesbarre.

The Philadelphia *Ledger* says: "The Pennsylvania Railroad Company, February 21, 1872, leased for the term of 33 years this road, on condition that the company should complete the road and connections at its own proper cost, or permit the lessees to complete the same and charge the cost to the lessor, payable either in mortgage bonds or capital stock of the company at their respective market prices, or in cash, as the lessor should elect. The Danville, Hazleton & Wilkesbarre Railroad Company having failed to make the improvements conditioned, the Pennsylvania Railroad Company made them at a cost of $46,055, and in reimbursement of the same demand payment therefor as conditioned, which is not paid. The company is believed to be insolvent, and has right of way and land damage claims against it of some $40,000, which, being a lien prior to the bonded debt of the company, endangers the sale of the road, to the prejudice of bondholders. The expenses of the Pennsylvania Railroad in working the leased road being in excess of the revenues from the same, that company has applied to the Court of Common Pleas in equity to have the said violated lease rescinded and set aside, and a receiver appointed."

Indianapolis, Bloomington & Western.

The Receiver, Gen. Geo. B. Wright, has petitioned the Court for permission to borrow money to pay off the employes and to make needed repairs of road and equipment. Gen. Wright intends to put the road-bed and track into thoroughly good order and to make some additions to the equipment. It is understood that his policy is approved by a large majority of the bondholders.

Hannibal & St. Joseph.

The bill which was before the Missouri Legislature to repeal the act of last year providing for the extension of the State aid bonds issued to the road has finally failed. The State claims that the company has not fulfilled its part of the agreement.

Central of New Jersey.

The old report is revived that this company intends to build a tunnel under Newark Bay, from Elizabethport to Bergen Point, to replace the present long bridge. It is not at all likely to be true, for, while the present Bay Bridge is a source of continued trouble and expense, a tunnel, even if it is practicable, which could only be assured by a thorough survey, would certainly be enormously expensive. A minor objection is that it would require a very heavy grade from the east end of the tunnel to the Port Johnson coal docks. The Bay Bridge will probably stand several years longer, especially as the company is secure from any interruption to travel in case of accident to it, having a second line from Elizabethport by way of the Newark Branch.

Missouri, Kansas & Texas.

It is reported, apparently by authority, and is not denied, at any rate by the Atlantic & Pacific people, that the first-mortgage bondholders intend shortly to begin foreclosure proceedings and that they intend, in the event of their purchasing the road, to sell or lease it to the Atlantic & Pacific Company. President Peirce, of the latter, has recently been making an investigation into the condition and business of the road.

New York & Oswego Midland.

Trains are to be run over the New Berlin Branch, from Sidney to New Berlin, provided the people of the latter place will clear up the road and put it in readiness for trains.

Helena & Iron Mountain.

The contractor for the road, the Southwestern Construction Company, has begun work at Forrest City, Ark., and the intention is to have the road complete from Forrest City to Helena, 42 miles, this year.

The Brotherhood of Locomotive Engineers.

There is a good deal of talk about a strike by this organization in order to prevent any further reductions in wages. There is no doubt that many of the members feel very sore over the constant reductions of pay they have had to submit to during the past year. It is thought, too, that the present head of the order is much more favorably disposed towards strikes than his predecessor.

Muncie, Frankfort & Western.

This company, which purposes to use that abandoned road-bed of the Lafayette, Muncie & Bloomington east of Lafayette, Ind., has given notice to the old company that unless it appoints an appraiser to represents its interests in the appraisement of the abandoned line by April 10, the auditor will be requested to make the appraisement, and the appraisement proceeded with.

Rockford, Rock Island & St. Louis.

In the United States Circuit Court in Chicago, March 22, the Court directed the Receiver to pay H. H. Porter, a claim for one-third of the purchase money of certain cars, which he holds by assignment from the Barney & Smith Manufacturing Company. A claim for rental made by Mr. Porter was disallowed.

An order was made for all parties interested to appear March 30 and show cause why the claim against H. H. Boody should not be compromised. The Receiver states that Boody has nothing, and that if a judgment against him is pressed nothing can be secured, but that if the matter is compromised Boody will surrender books and papers which he holds, and which will be of much value in contesting certain claims against the road, and a relation of his will pay a certain percentage on the claim.

San Francisco, San Mateo, & Santa Cruz.

This company has been organized for the purpose of building a narrow-gauge railroad from San Francisco southward through Spanishtown, San Gregorio and Pescadero to the line between San Mateo and Santa Cruz counties, where it will connect with the Santa Cruz road, now under construction. The road will be about 50 miles long and will be nearly parallel with the sea coast. It is intended, like the Santa Cruz road, to be a link in a line from San Francisco to Monterey, and eventually to Santa Barbara and Los Angeles.

Lake Tahoe.

Work is in progress on a narrow-gauge railroad eight miles long from Lake Tahoe, Cal., to the head of Clear Creek, on the summit of the Sierra. A very good route has been found, the only heavy work being a tunnel 500 feet long. It is intended mainly to carry lumber from the mills near the lake to the lumber flume on Clear Creek. The builders are the lumbering firm of Yerington, Bliss & Co.

West Wisconsin.

The committee appointed at the recent meeting of bondholders made its report to an adjourned meeting held March 25. The committee believes that a foreclosure is not advisable for several reasons, one being that the business of the road is almost entirely dependent upon its connecting lines at each end. Amicable relations with these are secured by the present management, but these might be broken up if the road passes into other hands. In case of a sale of the road the exemption of the lands from taxes would be lost. A foreclosure would involve tedious and expensive litigation to determine the lien of the various interests on the property. In view of all the interests involved the committee recommend bondholders to accept the company's proposition and fund their coupons.

After some debate the report was adopted, and a number of the bondholders present signed the funding agreement.

Wilmington & Reading.

The coupons due April 1, on the first-mortgage bonds were not paid. The amount of the bonds outstanding is $1,250,000. There are also outstanding $1,560,000 second-mortgage bonds, the interest on which has been in default since January, 1874.

The road is 72 miles long, from Wilmington, Del., north by

west to Reading, Pa. It has been in operation several years from Wilmington to Birdsboro, nine miles from Reading, and was completed into Reading a little over a year ago. The Berks County road was intended as an extension of the road to the Lehigh region, but failed, and has passed into the hands of the Philadelphia & Reading Company. The Wilmington & Reading road has been obliged to depend entirely upon local traffic, being unable to secure any connections beyond Reading, and has never been financially successful. Its net earnings for 1873 were only $22,651, and for 1874, $7,807.

At the March term of the Court of Common Pleas the holders of some of the second-mortgrge bonds secured a judgment on $15,000 of unpaid coupons, and an execution was issued for the sale of the franchise. The company asked subsequently to have the execution set aside on the ground that the Court could not order the sale of a franchise extending into another State. Judgment was reserved.

San Bernardino.

This company has been organized at San Bernardino, Cal., for the purpose of building a railroad about four miles long from that town to the nearest point on the Southern Pacific. The capital stock is to be $125,000.

Kansas Pacific.

A meeting was held in Philadelphia, March 26, between representatives of this company and the Union Pacific. It is understood that the purpose of the meeting was to arrange terms for the exchange of through business between the two roads and also for the interchange of traffic to and from Colorado at Cheyenne.

Canada Central.

The contract with the Canadian Government for the extension of the road from Douglas, Ont., to the east end of Lake Nipissing has been finally approved and signed.

Maine Central.

At the annual meeting in Waterville, Me., March 24, there was a very large attendance of stockholders and some animated discussion as to the policy of the company and the names proposed for election as directors. The election resulted in the choice of the ticket in the interest of the Eastern Railroad Company, which received 21,376 votes out of 34,046 cast. The opposition ticket was favored by the Boston & Maine people and most of the local stockholders in Maine.

European & North American.

A compromise has been agreed upon in the case of certain tracts of land, 35,000 acres in all, which the company has heretofore claimed under a grant from the State. The company agrees to withdraw its claim and the State will make no demand for the money received by the company for stumpage on lumber cut on the land in dispute.

Auction Sales of Railroad Securities.

The following prices were obtained in New York last week for securities sold at auction: Indianapolis & Vincennes, first-mortgage bonds, 60; Northern Pacific, first mortgage 7.3 per cent. gold bonds, 16¼ to 17¼; Northern Pacific, currency 7 per cent. land warrant bonds, 20¼; Clayton & Theresa, first-mortgage bonds, 80.

Farmers' Union.

This is the name adopted by a company which has effected a preliminary organization and which proposes to build a narrow-gauge railroad from the Mississippi at Sabula or Clinton, Ia., by way of Vinton and Liscomb to Monona on the Missouri. The capital stock is to be $2,000,000.

Minneapolis, St. Paul & Iowa.

A company by this name has been organized to build a road from Minneapolis south by way of Albert Lea to the Iowa line. The capital stock is to be $2,500,000.

Chicago, Danville & Vincennes.

The foreclosure suit which was begun in the Will County (Ill.) Circuit Court, and in which Messrs. Hammond and Brown were appointed receivers, has been transferred to the United States Circuit Court. The company has filed in that court a petition for the removal of the receivers.

New Jersey & New York.

A branch of this road from Nanuet, N. Y., to New City, four miles, is nearly finished and is to be opened about May 1. A considerable increase of the passenger equipment has been ordered.

Poughkeepsie & Eastern.

The foreclosure sale, which was to have taken place March 24, has been adjourned to April 14.

Elizabeth City & Norfolk.

Work is progressing steadily on the southern end of this line. The heavy fill on Poindexter Creek, near Elizabeth City, N. C., is nearly finished.

Raleigh & Augusta Air Line.

This company will receive until April 13 proposals for the grading and masonry of a section of six miles from Moroson's, N. C., southward. Profiles and plans can be seen and information obtained on application to C. O. Sanford, Chief Engineer, at Sanford, N. C.

Bellaire & Southwestern.

A company is to be organized to build a narrow-gauge road from the Baltimore & Ohio and the Ohio River at Bellaire, O., west by south to McConnellsville, on the Muskingum River, a distance of about 65 miles.

Mobile & Ohio.

Owing to the light traffic and great depression of business during the past year, this company was obliged to pass the interest due on its second-mortgage bonds March 1. The board addressed a circular letter to the bondholders in which they express the hope that if no adverse action is taken the company will be able shortly to resume payment of interest on the bonds in question. The amount of these bonds outstanding by the last annual report was $1,443,848, and they bear 8 per cent. interest.

The floating debt has been so arranged and extended that no large amount will be due before the close of the current year.

Chicago & Paducah.

The Illinois Circuit Court appointed Charles Voris, of Windsor, and M. W. VanValkenburg, of Greenville, receivers. They filed bonds in the sum of $250,000 each, and were to take possession at once.

Before they could take charge, however, the order appointing them was revoked, and they were discharged. It is stated that the order of appointment was made hastily, without notice to the company, and on application of a stockholder. On the full hearing the charges of the plaintiff were disproved and the order revoked.

New Jersey Midland.

A plan for the reorganization of the company was to be submitted last week. Its main points were that the first-mortgage bondholders should surrender their coupons up to April 1, 1880, taking preferred stock in payment; the second-mortgage bondholders in like manner to exchange their coupons for preferred stock until 1880; the third-mortgage bondholders and floating debt creditors to take stock or new bonds for their claims at the rate of 50 cents on the dollar. Under this arrangement it is calculated that the debt in 1880 will be about $7,500,000, or about $100,000 per mile. It is not at all likely that the road would be able to pay more than 2 or 3 per cent. on this amount, so that this plan would be merely a postponement of trouble.

The first-mortgage bondholders have notified the Receiver that they intend to begin proceedings in foreclosure shortly. They will also apply for the appointment of new trustees under the mortgage.

There appears to be some uncertainty as to the position of the Middletown & Unionville road, heretofore leased by the New Jersey Midland. The road is being run at present by Mr. D. Thompson with certain rolling stock purchased at sheriff's sale. The legality of the sale and also of Mr. Thompson's possession of the road is, however, in dispute.

ANNUAL REPORTS.

Chicago, Burlington & Quincy.

For the first time in many years there has been no increase in the mileage worked, which was for the calender years 1873 and 1874, 1,263.81 miles of road, 680.29 of which is called main line. There was at the close of 1874 286.46 of steel track in this road, and it had 252.69 miles of side track, 61.5 miles of double track.

The equipment was: 302 locomotives; 112 passenger and 59 baggage, mail and express cars; 4,160 freight, 1,714 platform and coal, 128 way and conductor's, 1 refrigerator car, and 403 service cars of different kinds, besides 407 hand cars.

The company has also a balance unsold of 103,621 acres of the land granted to the Burlington & Missouri River Railroad.

This property is represented by the following securities:

Capital stock Chicago, Burlington & Quincy	$19,898,910	
Capital Stock Burlington & Missouri River	6,740,103	
		$26,639,013
Funded debt of lines owned		20,879,075
Guaranteed bonds of branches		6,502,000
Total ($42,744 per mile)		$54,020,088

The capital stock is at the rate of $21,078 per mile of road work, all of which is substantially owned by the company.

The amount reported in the income account as paid for interest was 7.154 per cent. on the whole $27,381,075 of bonded debt.

The company also owns 6,640 shares of Chicago & Iowa Railroad stock, which are inventoried in the general account at $404,552.77—$60.93 per share—and 1,372 shares of Pullman Palace Car Company stock, which is inventoried at par.

The work done was:

	1874.	1873.	Inc. or Dec.	P. c.
No. passengers	1,830,453	1,706,734	Inc. 123,719	7.24
Passenger mileage	85,356,325	83,275,830	Inc. 2,080,495	2.50
Tons of freight	2,420,628	2,221,741	Inc. 198,884	8.95
Tonnage mileage	445,686,220	418,385,184	Inc. 27,301,036	6.52
Tons hauled for other roads in their cars*	337,502	386,069	Dec. 48,567	12.59
Tonnage mileage of same	14,647,872	16,873,488	Dec. 2,225.616	12.01

The Chicago, Dubuque & Minnesota, which was hardly opened for traffic fairly in 1873, still contributed nearly four times as much traffic that year as in 1874, when 8,270 tons only of its freight passed over the Chicago, Burlington & Quincy between Chicago and Aurora.

The report of passenger mileage above does not include that of passengers travelling on mileage and season tickets, by which $90,524 was earned during the year.

The earnings and expenses for the years 1873 and 1874 compare as follows:

Earnings from	1873.	1874.	Inc. or Dec.	P. c.
Passengers	$2,611,062 50	$2,648,840 79	Inc. $37,778 29	1.45
Freight	8,195,348 74	8,603,826 15	Inc. 408,477 41	4.98
Miscellaneous	598,814 68	392,650 58	Dec. 206,164 10	34.41
Total	$11,405,225 92	$11,645 317 52	Inc. $240,091 60	2.10
Expenses:	**1873.**	**1874.**	**Increase.**	**P. c.**
Excluding taxes	$6,181,514 18	$6,219,283 41	$37,769 23	0.61
Taxes	253,253 64	294,228 98	40,975 34	16.20
Total	$6,434,767 82	$6,513,512 39	$78,744 57	1.22
Net earnings	$4,970,458 10	$5,131,805 13	161,347 03	3.25
Ratio of expenses to earnings.	1873.		1874.	
Excluding taxes	54 19-100 per cent.		53 41-100 per cent.	
Including taxes	56 41-100 per cent.		55 93-100 per cent.	
Earnings per mile of road	1873. $9,023 12	1874. $9,213 07	Inc. or Dec. Inc. $189 95	P. c. 2 10
Earnings per passenger per mile	3.023 cts.	3.009 cts.	Dec. 0.014 ct.	0.50
Earnings per ton per mile	1.92	1.90	Dec. 0.02	1.00
Earnings per ton per mile on through freight	1.27	1.24	Dec. 0.03	2.40
Earnings per ton per mile on local freight	2.45	2.43	Dec. 0.02	0.80

The increase in net earnings is nearly exactly in proportion to the increase in the stock and bonds. The net earnings were just about 9.50 per cent. on the gross amount of these securities in 1874, and a trifle less than 9.51 per cent. in 1873.

The additions to the property during the year consisted chiefly in renewing 81¾ miles of the road with steel instead of iron, the construction of 19.15 miles of side track, the addition to equipment of 14 locomotives, 2 passenger, 28 box freight, 17 platform and coal, 13 conductor's and way, and 2 wrecking and tool cars, and some new shops and tools, and land for various purposes, etc. The expenditure on account of construction was $1,096,810.

The General Superintendent, Mr. Robert Harris, referring to the Freight Auditor's report, says:

"These comparisons show several very interesting facts:

"First. That the rates have been substantially maintained the last year, the average earnings per ton per mile in 1874 being only 1 per cent. less than in 1873, while the inability of several roads immediately competing with this road to maintain themselves at the rates at which they have done business gives promise of a more conservative policy on their part in respect to rates.

"Second. That the through business, being that the most open to the competition of other lines, although a valuable business if the competing lines allow reasonable charge to be made for it, is not large as compared with the local business tributary to this road, which the road can better accommodate than any existing roads, and, it is believed, better than any that may be constructed hereafter.

"Third. That the steady and rapid growth of business on the line in Iowa more than compensates for that diverted by roads that have been constructed across this road in Illinois.

"In view of the interest that has been taken by the public at large in the matter of charges for railroad transportation, it may be proper to add that, while it can scarcely be expected that on a road with such extended and complicated business as this a scale of rates could possibly be established to which exception would not be taken by some, every effort has been made to avoid giving any just ground of complaint."

The Freight Auditor's report, by the way, is a most valuable document. Taken for a series of years it shows the development of the company's traffic from different sources. We copy the table of movement of through freight, comparing them with the figures of the report for 1873:

Tonnage of Through Freight Eastward.

	1874.	1873.	Inc. or Dec.	P. c.
Burlington to Chicago	74,328	72,324	Inc. 2,004	2.8
B., C. R. & M. R. R. to Chicago	33,938	28,445	Inc. 5,483	19.3
B. & S. W. R. R. to Chicago	10,428	9,542	Inc. 886	9.3
Keokuk to Chicago	11,019	11,168	Dec. 149	1.3
Points beyond Keokuk to Chicago	6,489	31,382	Dec. 24,963	79.6
K. & D. M., via Ottumwa, to Chicago	*26,207		Inc. 26,207	...
Quincy to Chicago	15,279	17,399	Dec. 2,120	12.2
Points beyond Quincy to Chicago	78,339	68,189	Inc. 5,150	7.5
Hannibal and beyond to Chicago	22,427	†6,855	Inc. 15,572	227.3
Hopkins and beyond to Chicago	36,108	25,759	Inc 10,349	40.2
Pacific Junction and beyond to Chicago	525	1,639	Dec. 1,114	67.9
Hamburg and beyond to Chicago	16,113	13 221	Inc. 2,891	21.9
Nebraska City and beyond to Chicago	22 961	24,262	Dec. 1,301	5.4
Plattsmouth and beyond to Chicago	48,689	42,683	Inc. 6,006	14.0
Council Bluffs and beyond to Chicago	25,401	23,010	Inc. 2,391	10 4
Total through freight eastward	423,351	423,251	Inc. 47 373	11 2

*All new; it formerly was taken at Keokuk.
†For five months only in 1873; during the first part of that year no traffic was taken at Hannibal.

Tonnage of Through Freight Westward.

		1874.	1873.	Inc. or Dec.	P. c.
Chicago to	Burlington	19,186	18,072	Inc. 1,114	6.2
"	B., C. R. and M. R. R.	16,204	6,548	Inc. 3,656	64.2
"	B. & S. W. R. R.	1,295	1,002	Inc. 293	29.3
"	Keokuk	10,848	7,960	Inc. 2,888	35.0
"	Points beyond Keokuk	205	6,756	Dec. 6,551	97.0
"	K. & D. M. R. R. via Ottumwa	6,043	*100	Inc. 6,043	....
"	Quincy	15,755	12,445	Inc. 3,310	26.5
"	Points beyond Quincy	35,587	42,887	Dec. 7,300	17.0
"	Hannibal and beyond	14,893	†7,611	Inc. 7,182	94.3
"	Hopkins and beyond	20,785	29,875	Dec. 9,090	30.4
"	Pacific Junction and beyond	252	12	Inc. 240	2000
"	Hamburg and beyond	2,962	2,260	Inc. 702	31.0
"	Nebraska City and beyond	7,791	6,791	Inc. 1,000	14.7
"	Plattsmouth and beyond	17,485	22,992	Dec. 5,507	23.9
"	Council Bluffs and beyond	24,650	31,103	Dec. 6,453	20.7
Total through freight westward		187,941	196,314	Dec. 8,373	4.26
Total through freight eastward		423,351	375,878	Inc. 47,373	17.2
Total through freight east and west		611,192	572,192	Inc. 39,000	6.8
Total local freight east and west		1,809,436	1,649,552	Inc. 159,884	9.7
Gross tonnage for whole line		2,420,628	2,221,744	Inc. 198,884	9.0

* None in 1873.
† Only five months in 1873.

The average tonnage of a loaded car in 1874 was 8 tons 1,850 pounds, of all cars run 6 tons 1,117 pounds, aside from Illinois Central and Chicago, Dubuque & Minnesota cars. The Illinois Central loaded cars between Chicago and Mendota averaged 8 tons 250 lbs., and all the cars 6 tons 1,228 lbs., the average earnings per ton per mile from this freight being 1.02 cents. The Illinois Central cars from Chicago to Aurora on the traffic that goes by way of Chicago & Iowa averaged 9 tons 451 lbs. of load per loaded car and 6 tons 757 lbs., for all cars. The Chicago, Dubuque & Minnesota cars for the same distance averaged 9 tons 522 lbs. loaded, and 6 tons for loaded and empty. The earnings from the latter traffic were 1.40 cents per ton per mile.

Of the Burlington & Missouri River land grant, 73,238 acres were sold during the year for $926,381, or at the rate of $12.64 per acre, and at a cost per acre of 92 cents. The receipts of the land department were $364,340.50, its expenditures for taxes and expenses $72,208.88. There is now due on contracts for sale of land $3,301,644. From the net cash receipts of the sales $532,847 has been paid in for sinking fund, and the 103,621 acres on hand are estimated to be worth $725,347.

Mr. J. M. Walker, the President, says:

"The recent legislation in Iowa and Illinois, in hostility to the railroad interests of those States, has not been repealed or modified by legislative action, nor is it likely to be at the session of the Legislature the present Winter.

"These laws, by their terms, cover both domestic and inter-State commerce, and it was early seen that their enforcement, if possible of enforcement at all, would result in injury to all interests, agricultural as well as every other. Hence, by general acquiescence, their provisions have not to any great extent been observed. If a strict compliance with their provisions were now possible, it would not be demanded by the general public, nor by those immediately connected with the business of your road.

"This kind of class legislation has not met public expectation, nor commanded general approval, and it is now apparent that at an early day these laws must be altogether repealed, or modified into such form and character as shall bring them within the sphere of that kind of legislative supervision and control, the limits of which seem to have been reasonably well defined by the courts.

"Upon the enactment of these laws it was the purpose of your directors to cause their constitutional validity to be tested at the earliest opportunity. Suits were brought in both States for that purpose. Two of them have been submitted to the court of last resort in Illinois, and now await, as it is confidently believed, a decision which will be favorable to the protection of the large interests represented by your directors.

"We have been at pains to obtain such statistics and information as could be had, bearing on the business of the ensuing year, and we think it may safely be assumed that it will at least equal that of 1874. The wheat crop, which ordinarily should have found a market in the Autumn of that year, in consequence of continued low prices is largely in the country, and its transportation will fall within the business of the present year.

"The amount of corn and other cereals to come forward is large, and an increase in the amount of live stock may reasonably be expected. The business of the present month will equal that of January of last year, and we know of no reason why we should not expect as large returns from the business in 1875 as was realized from that of the year now closed."

* The freight of the Illinois Central to and from Chicago on that part of its lines north and west of Forreston (80 miles from Forreston to Dubuque and the 402 miles of the Iowa lines) and that of the Chicago, Dubuque & Minnesota Railroad, pass over the Chicago, Burlington & Quincy between Chicago and West Aurora, 38 miles, running over the Chicago & Iowa between West Aurora and Forreston. The freight of the Illinois Central from Forreston southward to La Salle or thereabout passes over the Chicago, Burlington & Quincy between Mendota and Chicago, 84 miles. This traffic being received in loaded cars and in the case of the Illinois Central delivered to that company without any handling, is carried at special rates; but so far as use of road and motive power is concerned, it is the same as any other freight traffic.

The Workingmen's Train on the Eastern Railroad.

[From the Sixth Annual Report of the Massachusetts Railroad Commissioners.]

The experiment of cheap workingmen's trains on the Eastern Railroad has continued a decided and growing success. The history of the origin and progress of this experiment has been given in detail in the earlier reports of the Board. It is therefore merely necessary now to state that these trains leave Lynn for Boston over the Eastern Railroad at 5:35 o'clock each morning, and, returning, leave Boston at 6:35 in the evening; the fare is uniform (5 cents) for all distances, whether the entire trip or any part of it. The accompanying table shows the progress of the experiment during each of the two years of its trial:

	Number of Passengers.	Receipts.
1873.		
Regular trains	381,461	$52,182 79
Workingmen's trains	187,016	9,350 80
	568,477	$61,533 59
1874.		
Regular trains	468,920	$60,610 60
Workingmen's trains	266,560	13,328 00
	735,480	$73,938 60

Number of Passengers for each Month in Years 1873 *and* 1874.

MONTHS.	1873.	1874.	Per ct. of gain.
December (1872)	7,481	14,260	91
January	7,445	15,000	101
February	8,264	15,620	89
March	11,146	17,150	54
April	13,977	18,800	34
May	17,720	21,220	20
June	21,053	27,760	32
July	20,393	26,800	31
August	22,957	28,740	25
September	20,861	30,360	46
October	19,816	29,310	48
November	15,903	21,540	35
	187,016	266,560	42.5

	Per cent.
Increase of gross receipts of Eastern R. R. for year ending Sept. 30, 1874	34
Increase of net receipts of Eastern R. R. for year ending Sept. 30, 1874	82
Increase of gross receipts of workingmen's trains for year ending Nov. 30, 1874	42.5
Net loss of operating workingmen's trains for year ending Nov. 30, 1873	13.6
Net gain of operating workingmen's trains for year ending Nov. 30, 1874	50.6
Gain in regular passengers on Saugus Branch for year ending Nov. 30, 1874	22.9
Gain in workingmen passengers on Saugus Branch for year ending Nov. 30, 1874	42.5
Gain in regular receipts on Saugus Branch for year ending Nov. 30, 1874	16.1
Gain in regular passengers on Saugus Branch for 1874, compared with 1872	53.5
Gain resulting from workingmen's trains for 1874	87.2
Total gain in travel on Saugus Branch for 1874, compared with 1872	140.7

NOTE.—Workingmen's trains commenced running in November, 1872.

It will be observed that the growth of travel on these trains for the present year over that of the last has averaged 42 per cent., being highest (101 per cent.) in January, and least (20 per cent.) in May. As the tickets for this train are sold only in slips of twenty each, and as no money is received on the cars, the regular fares being exacted, each passenger represents a five-cent fare to the road; the receipts of the company from this source throughout the year, averaged, therefore, $21.29 per trip. According to the returns of the Eastern Railroad the average cost of running a passenger train is $1.088 per mile, or $14.14 for the trip from Boston to Lynn. It would therefore appear that during the second year the cheap train not only paid its expenses but earned a net profit at the rate of $7.15 per trip, or 55 cents per mile run. The average net earnings of passenger trains on the same road during the year were 48.4 cents per train mile, showing that the cheap five-cent train was 14 per cent. more profitable than the average passenger train. As compared with the previous year, the regular passenger earnings of the Eastern road increased 30.4 per cent. as respects the gross receipts and 107.7 per cent. as respects net receipts, whereas the increase in the gross receipts of the cheap train was 42 per cent., while the net loss of 15 per cent. on cost of operation in 1872–3 was converted into a net profit of 51 per cent. in 1873–4. During the former period the earnings of the cheap train were 15 per cent. of the entire passenger receipts of the Saugus Branch, and during the latter period they were 18 per cent. If the rate of progress which has hitherto been maintained is continued, the indications are that in another year the Eastern Railroad workingmen's trains will be found to be among the most remunerative per mile run which leave the city of Boston. The only difficulty seems likely to arise from their unmanageable size. Beginning in November, 1872, with two cars only, they had increased in August last to eleven cars, and nine is now the usual number. At first, these trains seemed to be regarded with a certain popular suspicion, especially by women, who used them but little. This is now rapidly changing, numbers of women go in them, and generally the class of passengers shows a constant and decided tendency to improvement.

In commenting on the course of this experiment in their last annual report, the Commissioners called attention to the important fact that the statistics of the several stations served by the cheap trains very clearly showed that those trains had not diminished the receipts by the regular trains, nor drawn passengers from them, but that they had apparently called a new class of travel into existence which, if it had any effect at all on other and regular travel, seemed rather to stimulate and develop it. The same thing has continued noticeable during the year just past. While the travel on the cheap trains between Boston and Lynn has increased 42 per cent., that on the regular trains, so far from showing any signs of diminution, has increased 23 per cent. From these facts but one inference can apparently be drawn. The introduction of the system of cheap trains has largely extended on the Eastern road the area in which labor can seek employment. The workingman can now daily carry his labor to any point where he can find a market for it, from Lynn to Boston. As a consequence of this the population moves much more. Men and women go in one class of trains and return in another, and they go and return far more frequently than formerly and for reasons of less importance. The habit of travelling is acquired, and once acquired it will not limit itself to any particular mode of travel. Apparently their experience has satisfied those managing the Eastern Railroad of the truth of these propositions, as they have this year evinced a lively interest in the results of the experiment, and show no disposition whatever to bring it to a close.

On the contrary, the success which has for two years now marked the progress of this bold experiment of the Eastern Railroad Company should, it would seem, be sufficient to induce other corporations to imitate it. It might also be tried in other shapes greatly to the public benefit. For instance, during the Summer months, and especially at the period of the harvest, cheap trains, running out of town in the early morning and returning in the evening, would lead to a much needed distribution of labor which the regular rates of fare effectually interdict. It is notorious that during what is known as the haying time of every Summer, there is a great dearth of labor in the country and often an equal dearth of employment in the city, but no machinery exists for bringing the laborer and the employer together. So also as respects recreation, these trains would afford an opportunity to get into the country to a large class, which now rarely enjoys it; indeed, they might, during the hot months, serve as daily excursion trains, running at regular hours and reduced rates. As yet, however, no corporation has shown any disposition to follow the example of the Eastern road, nor has any movement in behalf of a similar experiment on the line of any other road come to the knowledge of the Commissioners. It is practically useless for this Board to move in such matters, except in response to some manifestation of a public demand. If it acts from its own motion, it is uniformly met with a demand for some evidence that a proposed change is called for, or even desired; it is assured that the population living on the line of the particular road addressed is very peculiar that the experiment suggested is not desired by it, or would be most offensive to it; and that, finally, the existing method of operation is entirely satisfactory, and that any change in it would occasion great popular discontent. In fact, it was only by taking advantage of the strong desire felt by the management of the Eastern road to make that corporation popular, after the Revere accident, that this Board ever secured any trial at all of the cheap-trains experiment. Except for that, its recommendation, unsupported as it was by any earnest manifestation of a popular demand, would have resulted in nothing In now once more taking leave of the subject, the Commissioners can, therefore, only say that if those living on the lines of other roads wish to have the benefit of trains similar to those running on the Eastern road, they must give some organized indication of that desire. It is not believed that any further legislation will be found necessary. Should i prove to be so, however, this Board will be perfectly ready to frame and to recommend it. Meanwhile, all that is now required is some pressure of public opinion—some evidence of a need; until that manifests itself, the corporations certainly will claim, as they legitimately may, that no exigency exists. However it may be elsewhere, it cannot be said that in Massachusetts no machinery is provided through which such a popular demand as that referred to can make itself felt. This Board, on the contrary, was organized, and in great degree is maintained, with this end in view, and always has been, and now is, perfectly ready to give both full consideration and expression to any reasonable demand of the community on the railroad corporations.

The Working of the Massachusetts Railroad Commission.

[From its Sixth Annual Report.]

PETITIONS AND COMPLAINTS.

The number of petitions and complaints preferred before the Board against railroad corporations has, during the last year, been unusually small. Of these, several have related to stations and questions of running accommodation, calling for no detailed report. One only has been of any general interest—the complaint of certain inhabitants of the city of Boston in relation to the alleged excessive and unnecessary use of the steam-whistle. This matter had heretofore been brought to the notice of the Board, and a circular in relation to it had been issued to the various corporations, but without producing the desired result. (Fourth Annual Report, 1873, pp. 25-8.) The abuse now, however, was at last formally presented in such a way that decisive action could be taken upon it. A hearing was had, and the very grievous nature of the nuisance, and the widespread discomfort and even distress occasioned by it at once became apparent. Reports of the hearing were published in the various papers, and in response to them additional complaints came in from every quarter; and, when finally the recommendations of the Board were published, they were very widely commented upon and approved. The report and recommendations of the Board will be found in Appendix E. In compliance with it, the practice of excessive whistling was subsequently put a stop to on the Boston & Providence road, against which the complaint was more immediately directed, and was more or less modified on other roads, and few, if any complaints have since that time been received in respect to it There is, however, none the less reason to believe that the nuisance has not yet been fully abated. In this connection, therefore, it seems appropriate to repeat what has already been said in reference to the necessity of some expression of a public desire to enable the Commissioners to take any effective action in the matter of additional cheap trains. The members of this Board, it should be borne in mind, are neither ubiquitous nor omniscient, and they can proceed effectively in any matter only on complaint made to them. This fact does not appear to be generally appreciated. Indeed, an impression seems to prevail in many quarters that the Board can, and should, remedy every evil and abuse incident to the operation of railroads without any one being at the trouble of informing it of the locality and nature of such evil or abuse. In this matter of the abuse of the locomotive whistle, for instance, the Board is ready to act on any and every complaint presented to it, and it entertains no doubt whatever of its ability to effect a remedy It is undeniable, however, that the corporations and their employes are very much wedded to their accustomed ways of operating their roads, and are altogether too much disposed to regard and treat any outside remonstrance or suggestion, from whatever quarter emanating, as an uncalled-for interference. This is, perhaps, not wholly unnatural, but it is equally not insuperable. To make a complaint is the simplest thing possible, requiring merely the use of a sheet of paper and a postage stamp, and repeated experience has shown that, where acting upon complaint, the Commissioners are always able to effect some results; without it, they are at once met with the question whether any specific complaints have been made to them; and, if none have been made, what ground is there to suppose that a real cause for them exists? Common notoriety is not accepted as evidence by the particular corporation addressed; in such case, the existence of an abuse is always conceded, so far as corporations as a rule are concerned, but that especial corporation, on that particular point, feels itself wholly free from fault, and sufficient evidence of this is adduced from the fact that no complaint has been made on a subject of such general grievance. Even as regards the abuse of the whistle, this ground was taken by corporations included within the recommendation of the Board, who declined to take any action upon it, alleging that no complaint had been received from along the lines of road operated by them. The inference was one manifestly unfair, and had in it, indeed, an element not far removed from the ludicrous; and yet it was conclusive on the Board. If the people on the line of any given road did not care enough to waste even a postal card in forwarding a complaint, on what possible ground could this Board maintain the existence of a grievous nuisance? The Commissioners cannot too frequently, or too forcibly, remind both the Legislature and the public that their chief power rests in the public feeling, which they may at any time represent. Railroad corporations, as a rule, care but little for abstract principles, nor do they alter their methods of procedure in response to every suggestion, even from official quarters; they are, on the other hand, very sensitive indeed to public opinion, and they invariably yield to it when they feel that it is concentrated and persistent. To facilitate its concentration, and to impart consistency to it, must always remain a very important and, perhaps, the most useful function of this Board. A great step in the direction of many generally desired reforms would be secured if this fact were more fully appreciated by that very large class of persons who now continually vent their sense of injury against the corporations, either through loud but aimless denunciation, or through anonymous and consequently futile communications to the public press.

GENERAL CONDITION OF RAILROAD SYSTEM.

The considerations which have just been stated would lead the Commissioners to the conclusion that the relations now existing between the community, as a whole, and the railroad system of the State, are more than usually quiet and satisfactory. Certainly, no evidence to the contrary has reached this Board in any official shape. Parties having, or thinking that they have, some general or specific cause of complaint against the railroad corporations, as a whole or individually, have heretofore, however, met such a statement as this with a general reply, to the effect that their causes of complaint were notorious enough, but that it was not worth while to bring them to the notice of the Board of Railroad Commissioners, it having no power to do anything but to recommend, and being wholly unable to enforce any compliance with its recommendations. In response to this, the Commissioners can only say that if their recommendations avail nothing, they on the other hand cost nothing. Every complaint presented to them is investigated, without even the necessity of attendance by the parties aggrieved, and the corporations are thus made to feel that they are subject to a perpetual supervision. This Board, however, as the result of five years of practical experience, is by no means disposed to concede the fact that it is devoid of power, or that it is necessary, or even desirable, that its powers should be increased. Wherever the Board has had any of force of public opinion behind it, it has, on the contrary, uniformly found its power to recommend all that the occasion required. It now certainly devolves upon those who refuse to avail themselves of its assistance to show that this is not the case. The Legislature has a right to suppose that no serious causes of complaint against the railroad corporations exist on the part of the community, so long as no one tries to avail himself of the means of redress against them placed within his reach, and costing neither his time nor his money. Whenever any party shall seek to avail himself of these means of redress, and they shall be found insufficient, the corporations treating with indifference or contempt any well-considered recommendation emanating from this Board, then, and not before, those having causes of complaint will have a right to assert that existing remedies are inadequate. That contingency has not yet presented itself. When it does, the Legislature may rest assured that this Board also will present itself to it, asking that another tribunal may be constituted, with powers equal to the emergency.

General Law for Organizing Railroad Companies in the Territories.

Just at the close of its session Congress passed the following law, which renders unnecessary any special charter for a railroad in the territories:

Be it enacted, etc., That the right of way through the public lands of the United States is hereby granted to any railroad company duly organized under the laws of any State or Territory except the District of Columbia, or by the Congress of the United States, which shall have filed with the Secretary of the Interior a copy of its articles of incorporation and due proofs of its organization under the same, to the extent of 100 feet on each side of the central line of said road; also the right to take from the public lands adjacent to the line of said road material, earth, stone, and timber necessary for the construction of said railroad; also ground adjacent to such right of way for station buildings, depots, machine shops, side tracks, turn-outs, and water stations, not to exceed in amount 20 acres for each station to the extent of one station for each 10 miles of its road.

SECTION 2. That any railroad company whose right of way or whose track or road-bed upon such right of way passes through any canon, pass, or defile, shall not prevent any other railroad company from the use and occupancy of the said canon, pass, or defile for the purposes of its road in common with the road first located, or the crossing of other railroads at grade; and the location of such right of way through any canon, pass, or defile shall not cause the disuse of any wagon-road or other public highway now located therein, nor prevent the location through the same of any such wagon-road or highway, where such road or highway may be necessary for the public accommodation; and where any change in the location of such wagon-road is necessary to permit the passage of such railroad through any canon, pass or defile, said railroad company shall, before entering upon the ground occupied by such wagon-road, cause the same to be reconstructed, at its own expense, in the most favorable location, and in as perfect a manner as the original road.

Provided, That such expenses shall be equitably divided between any number of railroad companies occupying and using the same canon, pass or defile.

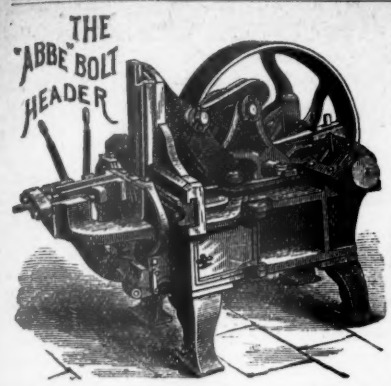
SEC. 3. That the Legislature of the proper territory may provide for the manner in which private lands and possessory claims on the public lands of the United States may be condemned, and where such provision shall not have been made such condemnation may be made in accordance with Sec. 3 of the act entitled "An act to aid in the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean, and to secure to the Government the use of the same for postal, military and other purposes, approved July 1, 1862." Approved July 2, 1864.

SEC. 4. That any railroad company desiring to secure the benefit of this act shall within twelve months after the location of any section of twenty miles of its road, if the same be on surveyed lands, and if upon unsurveyed lands within eighteen months after the survey thereof by the United States, file with the Register of the Land Office for the district where such land is located, a profile of its road, and upon approval thereof by the Secretary of the Interior, the same shall be noted upon the plats in said office. And thereafter all such lands over which such right of way shall pass shall be disposed of subject to such right of way.

Provided, That if any section of said road shall not be completed within five years after the location of said section, the rights herein granted shall be forfeited as to any such uncompleted section of said road.

SEC. 5. That this act shall not apply to any lands within the limits of any military post, or Indian reservation, or other lands specially reserved from sale, unless such right of way shall be provided for by treaty stipulation, or by act of Congress heretofore passed.

SEC. 6. That Congress hereby reserves the right at any time to alter, amend or repeal this act or any part thereof.



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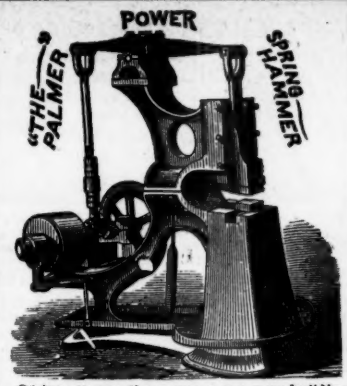

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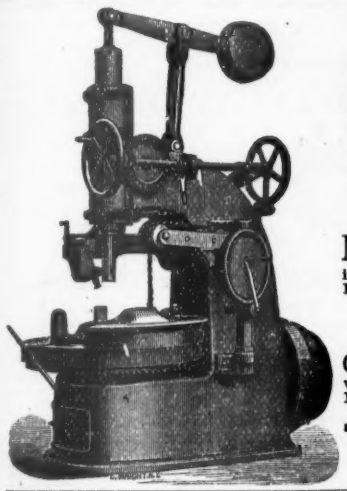

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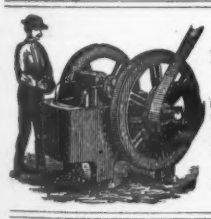

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Fig 1.

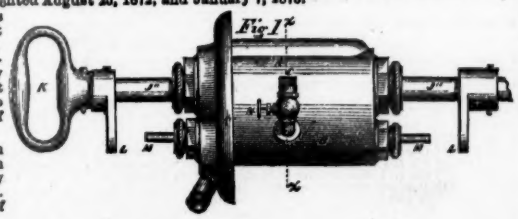
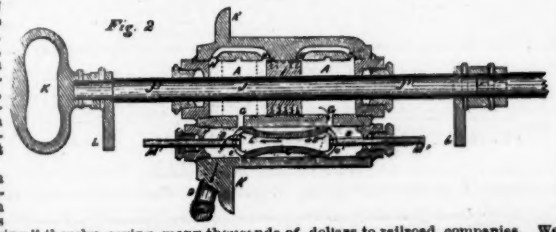


Fig. 2



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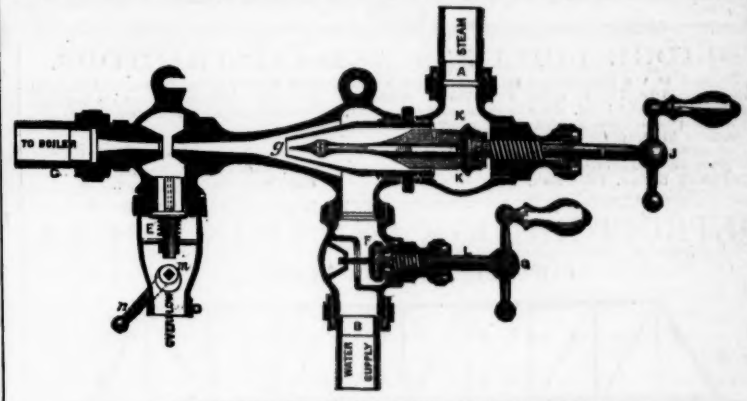

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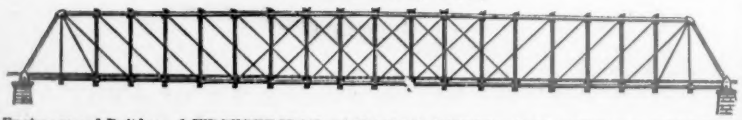

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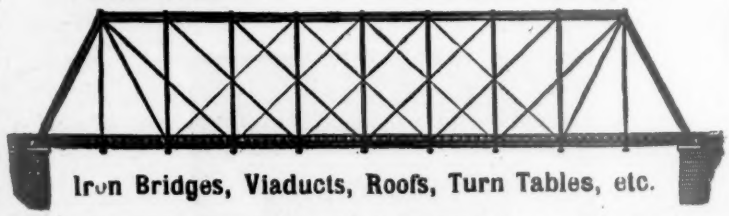

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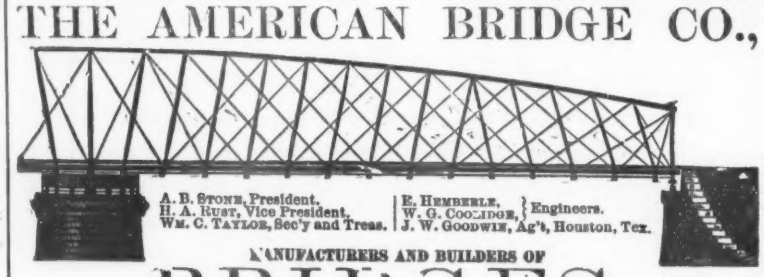

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